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## A List of the Spiders of the Grand Teton Park Area, with Descriptions of Some New North American Spiders

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The present paper is based largely on collections made during the summers of 1950 and 1953 by the first author, Donald C. Lowrie, in the Grand Teton National Park region of western Wyoming. During a three-month period in 1950, from June 11 through August 30, the base of operations was the Jackson Hole Research Station of the New York Zoological Society. Donald C. Lowrie herein expresses his sincere appreciation to the New York Zoological Society for sponsoring this project by a grant-in-aid. At this time, acknowledgement is made of the cooperation of Dr. Herbert W. and Lorna R. Levi who, also in residence at the Research Station during 1950, aided in the preliminary identification of some of the material. The results of the Levis' summer work has been reported as part of a paper entitled "Report on a collection of spiders and harvestmen from Wyoming and neighboring states" (1951, *Zoologica*, vol. 30, pp. 219-237, figs. 1-50). Two additional records (*Tapinocyba simplex* and *Collinsia plumosa*) noted by them are reported here for the first time. During the summer of 1953 the first author spent most of July and August working in the Teton area, but only a modest amount of time was devoted to collecting spiders. Altogether, about 3700 specimens were taken during the five-month survey of 1950 and 1953, and most of these are now deposited in the collection of the American Museum of

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Natural History. A primary aim of the Teton project was to make an ecological population study of the spiders of the herbaceous stratum, which will be published in a separate paper at a later date.

The Grand Teton range area comprises a segment of the middle Rocky Mountains. Although dominated by a subalpine montane forest, it includes numerous habitats from the low river valleys bordered with sagebrush to the bare rocks and small patches of tundra above tree line. Consideration of the spider totals (19 families, 98 genera, 193 species) brings to light various items of interest. Almost every genus is holarctic or has near relatives in the Old World. At least 40 species (20%) also occur in Palearctica, and most of these reach northern Europe.

The family Lycosidae with 24 species (12%) is very well represented, as is usual in mountainous and northern localities, and the genus *Pardosa* is notable with 16 species. In the family Clubionidae, seven of the 11 species belong to *Micaria*.

The families Linyphiidae and Erigonidae together (with 54 species, or 27%) are of good representation but fall short of the expected percentage for such areas. The comparable percentage for New York State is 31 per cent, for Newfoundland, 43 per cent, and for Alaska, 47 per cent. A more intensive investigation of the ground detritus will probably enlarge the representation in these families.

The division of labor for the present paper has been essentially as follows: The first author, whose especial interests are in the ecological aspects of araneology, was responsible for the collecting and bringing together of nearly the entire collection, for most of the preliminary identifications, and for the description of several of the species. The second author contributed advice on nomenclature, identified some of the more difficult species, described some of the new species, and prepared the entire paper for publication. Furthermore, he accepts full responsibility for the opinions on generic synonymy included in the introductory remarks on *Pellenes*. The drawings of the male palpi of *Pellenes* were finished by Miss Majorie Statham, to whom we offer sincere thanks.

The 10 new species of North American spiders described in this paper come largely from the western United States. Five of these were noted for the first time in Teton material, but at the present time only two are still known only from specimens from this restricted area. A résumé is given of the American representatives of the salticid genus *Pellenes*. One of five species described as new comes from the Chicago area, but the others are western. The female of what is apparently *Micaria tetonia*, named by Levi and Levi in 1951, is described and figured here for the first time. All holotypes, allotypes, and most of the paratypes are de-

posited in the collection of the American Museum of Natural History.

The following list includes all the spiders recorded from the Tetons by Levi and Levi in 1951 as well as those additional species from collections made by the senior author. This is virtually the complete list of Teton spiders known to date, even though some records in the literature may have been missed. As an aid for anyone interested in the abundance of the species the word "common" or "rare" is to be found after certain of the species. About 50 are listed as common, whereas more than 70 are considered as rare. The common ones are those that have been found repeatedly or that were found in several different areas, though not in great numbers anywhere. It is reasonably certain that all those listed as common could be found readily in the Jackson Hole valley and surrounding mountains in a collecting period of a couple of weeks during the summer months. Some species seem to be less common as a consequence of the fact that their habitat niches are not widespread in the area. However, they are listed as common because they can readily be found in the particular habitat that they seem to prefer. *Callobius nomeus*, for example, is common enough in rotting logs, and *Pirata insularis* is easily found on the surface of ponds, but neither is very widespread in Jackson Hole because their habitats are not widespread. In addition, more collecting must be done before the status of abundance can be ascertained for many of the species.

The species considered as rare will eventually, in many cases, turn out to be not so rare. This will be especially true of many of the small Linyphiidae and Erigonidae. The species listed as rare at present are the ones collected only once or only at one place. Some species have been included on the basis that a particular niche, especially the herbaceous stratum, was collected so thoroughly that the few specimens found probably indicate a true rarity even when they are represented by more than a single specimen.

#### SPIDERS OF THE GRAND TETON NATIONAL PARK AREA

Family Agelenidae (two genera, two species)

*Agelenopsis utahana* (Chamberlin and Ivie), 1933. Common

*Cicurina robusta* Simon, 1886

Family Amaurobiidae (two genera, two species)

*Callobius nomeus* (Chamberlin), 1919. Common

*Titanoeca nivalis* Simon, 1874. Common

Family Anyphaenidae (one genus, one species)

*Anyphaena pacifica* (Banks), 1896. Rare

Family Clubionidae (three genera, 11 species)

*Clubiona canadensis* Emerton, 1890. Common

*Clubiona kulczynskii* De Lessert, 1905

- Clubiona moesta* Banks, 1896. Common  
*Micaria altana* Gertsch, 1933  
*Micaria coloradensis* Banks, 1896  
*Micaria foxi* Gertsch, 1933  
*Micaria hesperella* Gertsch and Jellison, 1939  
*Macaria jacksonia* Levi and Levi, 1951. Rare  
*Micaria pulicaria* (Sundevall), 1832. Rare  
*Micaria tetonia* Levi and Levi, 1951. Rare  
*Scotinella formidabilis* (Chamberlin and Gertsch), 1930  
Family Dictynidae (three genera, 12 species)  
*Dictyna annulipes* Blackwall, 1846. Common  
*Dictyna artemisia* Ivie, 1947  
*Dictyna borealis* O. P.-Cambridge, 1872. Rare  
*Dictyna completa* Chamberlin and Gertsch, 1929  
*Dictyna cruciata* Emerton, 1888. Rare  
*Dictyna horta* Gertsch and Ivie, 1936. Rare  
*Dictyna major* Menge, 1869  
*Dictyna phylax* Gertsch and Ivie, 1936. Common  
*Dictyna tridentata* Bishop and Ruderman, 1946. Common  
*Dictyna uintana* Chamberlin, 1919  
*Lathys alberta* Gertsch, 1946  
*Tricholathys spiralis* Chamberlin and Ivie, 1935. Rare  
Family Argiopidae (six genera, 11 species)  
*Aculepeira aculeata* (Emerton), 1877. Common  
*Aculepeira verae* Chamberlin and Ivie, 1942. Common  
*Araneus gemmoides* (Chamberlin and Ivie), 1935  
*Araneus marmoreus* (Clerck), 1757. Common  
*Araneus nordmanni* (Thorell), 1870. Common  
*Araneus patagiatus* (Clerck), 1757. Common  
*Araneus trifolium* (Hentz), 1847. Rare  
*Araniella displicata* (Hentz), 1847. Common  
*Cyclosa conica* (Pallas), 1772. Common  
*Metepeira foxi* Gertsch and Ivie, 1936. Rare  
*Singa variabilis* Emerton, 1884. Common  
Family Gnaphosidae (eight genera, 12 species)  
*Callilepis altitudonis* Chamberlin, 1936  
*Drassodes neglectus* (Keyserling), 1887. Common  
*Drassyllus lamprus* (Chamberlin), 1920  
*Gnaphosa brumalis* Thorell, 1875  
*Gnaphosa muscorum* (L. Koch), 1866. Common  
*Gnaphosa parvula* Banks, 1896  
*Haplodrassus signifer* (C. L. Koch), 1839. Rare  
*Orodassus coloradensis* (Emerton), 1877. Common  
*Poecilochroa montana* Emerton, 1890  
*Zelotes puritanus* Chamberlin, 1922  
*Zelotes subterraneus* C. L. Koch, 1839. Common  
*Zelotes sula*, new species. Rare  
Family Hahniidae (two genera, two species)  
*Hahnia glacialis* Soerensen, 1898  
*Neoantistea gosiuta* Gertsch, 1934

## Family Linyphiidae (10 genera, 25 species)

- Bathypantes brevipes* (Emerton), 1917. Rare  
*Bathypantes josephus* Chamberlin and Ivie, 1947. Rare  
*Bathypantes latescens* (Chamberlin), 1919. Rare  
*Bathypantes pullatus* O. P.-Cambridge, 1863  
*Centromerus cornupalpis* (O. P.-Cambridge), 1874. Rare  
*Helophora insignis* (Blackwall), 1841. Common  
*Labuella prosaica* Chamberlin and Ivie, 1943. Rare  
*Lepthyphantes agressus* Chamberlin and Ivie, 1943  
*Lepthyphantes arboreus* (Emerton), 1915. Common  
*Lepthyphantes chamberlini* Schenkel, 1950  
*Lepthyphantes complicata* (Emerton), 1882. Rare  
*Lepthyphantes furcillifer* Chamberlin and Ivie, 1933  
*Lepthyphantes lamprus* Chamberlin, 1920. Rare  
*Lepthyphantes nebulosus* (Sundevall), 1830  
*Lepthyphantes pollicaris* Zorsch, 1937  
*Lepthyphantes rainieri* Emerton, 1926. Rare  
*Linyphia litigiosa* Keyserling, 1886. Rare  
*Linyphia marginata* C. L. Koch, 1834. Common  
*Meioneta fillmorana* Chamberlin, 1919. Rare  
*Meioneta fratrella* (Chamberlin), 1919. Rare  
*Meioneta tumoa* (Chamberlin and Ivie), 1933. Rare  
*Meioneta zygia* (Keyserline), 1886  
*Microlinyphia bonita* (Chamberlin and Ivie), 1943. Common  
*Pityohyphantes alticeps* Chamberlin and Ivie, 1943. Rare  
*Pityohyphantes cristatus* Chamberlin and Ivie, 1942. Common

## Family Lycosidae (six genera, 24 species)

- Arctosa alpigena* (Doleschal), 1852. Common  
*Lycosa frondicola* Emerton, 1885. Rare  
*Lycosa pratensis* Emerton, 1885  
*Pardosa altamontis* Chamberlin and Ivie, 1946. Common  
*Pardosa anomala* Gertsch, 1933. Common  
*Pardosa coloradensis* Banks, 1894. Common  
*Pardosa distincta* (Blackwall), 1846  
*Pardosa dorsalis* Banks, 1894  
*Pardosa moesta* Banks, 1892. Rare  
*Pardosa solitudo* Levi and Levi, 1951. Rare  
*Pardosa steva*, new species  
*Pardosa tetonensis* Gertsch, 1933. Rare  
*Pardosa tristis* Thorell, 1877. Common  
*Pardosa uncata* Thorell, 1877  
*Pardosa uintana* Gertsch, 1933  
*Pardosa utahensis* Chamberlin, 1919  
*Pardosa wyuta* Gertsch, 1934. Rare  
*Pardosa xerampelina* (Keyserling), 1876  
*Pirata insularis* Emerton, 1885. Common  
*Pirata piratica* (Clerck), 1757  
*Schizocosa wasatchensis* Chamberlin and Ivie, 1942  
*Tarentula aculeata* (Clerck), 1757  
*Tarentula kochi* Keyserlin, 1876. Rare

## Family Erigonidae (26 genera, 29 species)

- Ceraticelus atriceps* (O. P.-Cambridge), 1874  
*Ceraticelus crassiceps* Chamberlin and Ivie, 1938. Common  
*Ceratinella brunnea* Emerton, 1882. Rare  
*Cochlembolus alpinus* (Banks), 1896. Common  
*Collinsia plumosa* (Emerton), 1882. Rare  
*Collinsia uta* (Chamberlin), 1919  
*Colonus cascadeus* Chamberlin, 1948. Rare  
*Cornicularia clavicornis* Emerton, 1882. Rare  
*Cornicularia communis* Emerton, 1882. Rare  
*Coryphaeolana*, species. Rare  
*Diplocentria bidentata* (Emerton), 1882. Rare  
*Disembolus chera* (Chamberlin and Ivie), 1933  
*Dismodicus decemoculatus* (Emerton), 1882. Rare  
*Erigone denticulata* Chamberlin and Ivie, 1939  
*Erigone dentosa* O. P.-Cambridge, 1894. Rare  
*Eulaira microtarsus* (Emerton), 1882. Rare  
*Floricomus rostratus* (Emerton), 1882. Rare  
*Hypselistes reducens* Chamberlin and Ivie, 1935. Rare  
*Islandiana alata* (Emerton), 1919. Rare  
*Minyrioloides affinis* Schenkel, 1929. Rare  
*Oedothorax trilobatus* (Banks), 1896. Rare  
*Pelecopsis sculptum* (Emerton), 1917. Rare  
*Pocadicnemis pumila* (Blackwall), 1841  
*Sciastes terrestris* (Emerton), 1882  
*Sisicottus montanus* (Emerton), 1882. Rare  
*Spirembolus vallicolens* Chamberlin, 1920  
*Tapinocyba simplex* (Emerton), 1882  
*Typhrochraestus pallidus* (Emerton), 1882  
*Walckenaera vigilax* (Blackwall), 1853
- Family Ochyroceratidae (one genus, one species)  
*Usofila oregona* Chamberlin and Ivie, 1942. Rare
- Family Oxyopidae (one genus, one species)  
*Oxyopes scalaris* Hentz, 1846
- Family Pisauridae (one genus, one species)  
*Dolomedes scopularis* C. L. Koch, 1848
- Family Salticidae (eight genera, 18 species)  
*Metaphidippus clematus* Levi and Levi, 1951. Common  
*Metaphidippus nigromaculatus* (Keyserling), 1884. Common  
*Paraphidippus marginatus* (Walckenaer), 1837. Common  
*Pellenes altanus* Gertsch, 1934  
*Pellenes americanus* (Keyserling), 1885. Rare  
*Pellenes brunneus* Peckham and Peckham, 1901  
*Pellenes falcata* (Clerck), 1757. Common  
*Pellenes laggani* Peckham and Peckham, 1909  
*Pellenes levii*, new species  
*Pellenes philipi* Gertsch and Jellison, 1939  
*Phidippus altanus* Gertsch, 1934. Common  
*Phidippus johnsoni* Peckham, 1883. Common  
*Phidippus tyrelli* Peckham, 1900

*Sitticus finschi* (L. Koch), 1879. Rare

*Sitticus haydeni* Levi and Levi, 1951. Rare

*Sitticus palustris* (Peckham), 1883

*Sitticus ranieri* Peckham and Peckham, 1909

*Talavera minuta* Banks, 1895. Rare

Family Tetragnathidae (one genus, two species)

*Tetragnatha laboriosa* Hentz, 1850. Common

*Tetragnatha versicolor* Walckenaer, 1841. Common

Family Theridiidae (seven genera, 14 species)

*Allotheridion differens* (Emerton), 1882. Common

*Allotheridion leechi* (Gertsch and Archer), 1942. Rare

*Allotheridion montanum* (Emerton), 1882

*Allotheridion ohlerti* (Thorell), 1870. Rare

*Allotheridion zelotypum* (Emerton), 1882. Common

*Ctenium fuscum* (Emerton), 1894. Rare

*Dipoena nigra* (Emerton), 1882

*Euryopis scriptipes* Banks, 1908

*Lithyphantes albomaculatus* (DeGeer), 1778. Common

*Steatoda hespera* Chamberlin and Ivie, 1933. Common

*Theridion aurantium* Emerton, 1915. Common

*Theridion marmoratum* Hentz, 1850

*Theridion rugosum* (Emerton), 1909. Common

*Theridion sexpunctatum* Emerton, 1882. Rare

Family Thomisidae (nine genera, 24 species)

*Apollophanes patricia* new species. Rare

*Coriarachne brunneipes* Banks, 1893

*Coriarachne utahensis* (Gertsch), 1932

*Ebo pepinensis* Gertsch, 1933

*Misumena valia* (Clerck), 1757. Common

*Oxyptila nevadensis* Keyserling, 1880

*Philodromus alascensis* Keyserling, 1884

*Philodromus aureolus* (Clerck), 1757. Rare

*Philodromus rufus* Walckenaer, 1825. Common

*Philodromus virescens* Thorell, 1877. Common

*Synema obscurum* Keyserling, 1880. Rare

*Thanatus altimontis* Gertsch, 1933. Rare

*Thanatus coloradensis* Keyserling, 1880

*Thanatus striatus* C. L. Koch, 1845. Rare

*Tibellus maritimus* (Menge), 1874. Rare

*Tibellus parallelus* (C. L. Koch), 1837. Common

*Xysticus benefactor* Keyserling, 1880

*Xysticus cunctator* Thorell, 1877

*Xysticus durus* Soerensen, 1898. Rare

*Xysticus emertoni* Keyserling, 1880

*Xysticus labradorensis* Keyserling, 1887. Common

*Xysticus locuples* Keyserling, 1880. Rare

*Xysticus mysticus* Chamberlin and Ivie, 1942

*Xysticus transversatus* (Walckenaer), 1837. Rare

Family Uloboridae (one genus, one species)

*Hyptiotes gertschi* Chamberlin and Ivie, 1935. Rare

## FAMILY LYCOSIDAE

*Pardosa steva*, new species

Figures 4, 5, 9

MALE: Total length, 5.00 mm. Carapace 2.60 mm. long, 2.30 mm. wide. Chelicerae 0.85 mm. long.

The general appearance is that of a dark, nearly black spider with legs becoming light towards the tips. Carapace nearly black except for an indistinct, dark brown, nearly circular patch slightly behind the center. Abdomen concolorous with carapace as are also the coxae, trochanters, and femora of all the legs. Beginning with the patella the leg segments become lighter in shade until the tarsi are a grayish tan in color. Palpus dark dorsally, with some lighter flecks, as is also true of the basal segments of the legs. Sternum virtually black. Under surface of legs same color as dorsal surface and abdomen except for a slight lightening of color in the median ventral abdominal surface. Light spots at base of coxae scarcely visible on first coxa, becoming larger with each succeeding coxa until the fourth covers an area nearly a quarter of the ventral surface. Chelicerae dark also except for region of the furrow which is a light tan. Body largely covered with short dark gray appressed hairs.

Eyes of the first row slightly procurved. Eye measurements as follows: first eye row, 0.56 mm.; second eye row, 0.81 mm.; third eye row, 1.10 mm. Eye diameters: anterior median, 0.13 mm.; anterior lateral, 0.09 mm.; posterior median, 0.31 mm.; posterior lateral, 0.31 mm. Distances between posterior median eyes, 0.32 mm.; between posterior lateral eyes (posterior row), 0.72 mm.; and distance between the posterior median and lateral eyes of each side, 0.31 mm. Posterior eye quadrangle wider (1.10 mm.) than long (0.76 mm.). Clypeus (0.13 mm.) as high as diameter of anterior median eye.

Leg formula, 4312, the lengths of the legs in that order, 11.00 mm., 9.30 mm., 9.20 mm., 8.90 mm. Tibia and patella of first leg, 3.10 mm. long; tibia and patella of fourth leg, 3.50 mm. long. Spines under first and second tibia, 2-2-2-2, under third and fourth, 2-2-2. Palpus nearly black all over, but with some tan flecks here and there. Femur subequal to tibia and patella which are about equal in length. Tarsus as long as tibia and patella. Palpus resembles *P. lapidicina* Emerton but varies as indicated in figures 4 and 9.

FEMALE: Total length, 7.40 mm. Carapace 3.30 mm. long, 2.60 mm. wide.

General dorsal appearance is that of a pepper-and-salt mottling, and closely resembling the pattern in *lapidicina*. Carapace marked with dis-



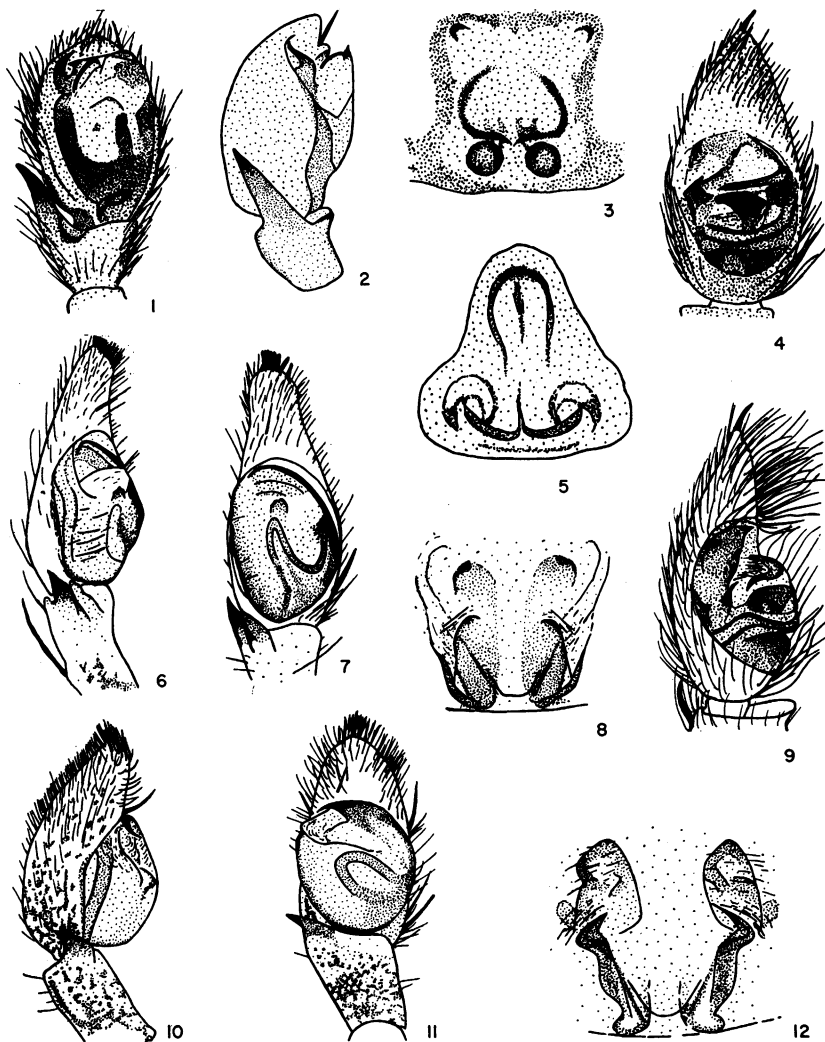
tinctly separated light and dark areas, the eye region darkest. Median pale stripe as wide as eye rows, with scalloped margins wider in middle but abruptly narrowed on posterior declivity, with a short dark line in center of area marking the longitudinal furrow. Sides dark, with three irregular light patches on each side, of which the middle one is largest and tends to coalesce with posterior patch. Clypeus lighter colored, with a dark marginal dot below each lateral eye. Abdomen dark, with more or less distinct light tan to yellow patches. Dorsum with an indistinct median dark lanceolate mark at base and with a series of light patches beside it which run down each side of the median area. Venter mottled, with more light spots towards center and more dark spots towards sides, forming an indistinct median light band, the area immediately around epigynum dark colored. Sternum and under side of femora similarly nearly uniform dark colored. Trochanters and coxae light in color. Femur, tibia, and metatarsus each with two distinct dark rings, one basal, the other distal to the middle. Metatarsus with an additional distal indistinct band. Patella with one dark proximal band and a distal light band. Tarsus unmarked or with slight duskiness. Palpal joints each with a basal dark band and terminal light one.

Eyes of first row slightly procurved. Eye measurements as follows: first eye row, 0.70 mm.; second eye row, 1.00 mm.; third eye row, 1.40 mm. Eye diameters: anterior median, 0.13 mm.; anterior lateral, 0.10 mm.; posterior median, 0.40 mm.; posterior lateral, 0.35 mm. Distances between posterior median eyes, 0.36.; between posterior lateral eyes (posterior row), 0.94 mm.; and distance between the posterior median and lateral eyes of each side, 0.49 mm. Posterior eye quadrangle wider (1.40 mm.) than long (1.00 mm.). Clypeus 0.20 mm. high.

Leg formula 4312, the lengths of the legs in that order, 16.20 mm., 12.30 mm., 12.10 mm., 11.90 mm. Tibia and patella of first leg, 4.60 mm.; tibia and patella of fourth leg, 5.20 mm. Spines under first and second tibia, 2-2-2-2, under third and fourth, 2-2-2. Anterior pair of spines of right first tibia reduced in the type specimen but apparent in most of the paratypes. Posterior one of the proximal pair of spines on fourth tibia very reduced, virtually lacking so that formula might also be 2-2-1. Epigynum similar to *P. lapidicina* Emerton but varies as indicated in figure 5.

TYPE LOCALITY: Male holotype, male and female paratypes from shores of Pilgrim Creek, north of Moran, Wyoming, July 12, 1950 (D. Lowrie).

OTHER LOCALITIES: Female allotype from 7500 feet along trail in Death Canyon, Grand Teton National Park, Wyoming, August 20, 1950



FIGS. 1-3. *Zelotes sula*, new species. 1. Right palp, ventral view. 2. Right palp, retrolateral view. 3. Epigynum.

FIGS. 4-5. *Pardosa steva*, new species. 4. Right palp, ventral view. 5. Epigynum.

FIGS. 6-8. *Apollophanes francesca*, new species. 6. Right palp, retrolateral view. 7. Right palp, ventral view. 8. Epigynum.

FIG. 9. *Pardosa steva*, new species, right palp, retrolateral view.

FIGS. 10-12. *Apollophanes margareta*, new species. 10. Right palp, retrolateral view. 11. Right palp, ventral view. 12. Epigynum.

(D. Lowrie) ; shores of Jackson Lake, near Moran, Wyoming, August 17, 1950, females and young (D. Lowrie).

This is a northern Rocky Mountain representative of the *lapidicina* group and is best separated from typical eastern *lapidicina* and the western forms by reference to the genitalic figures.

## FAMILY GNAPHOSIDAE

### *Zelotes sula*, new species

#### Figures 1-3

MALE: Total length, 4.20 mm. Carapace 2.10 mm. long, 1.60 mm. wide. Abdomen 2.20 mm. long, 1.30 mm. wide.

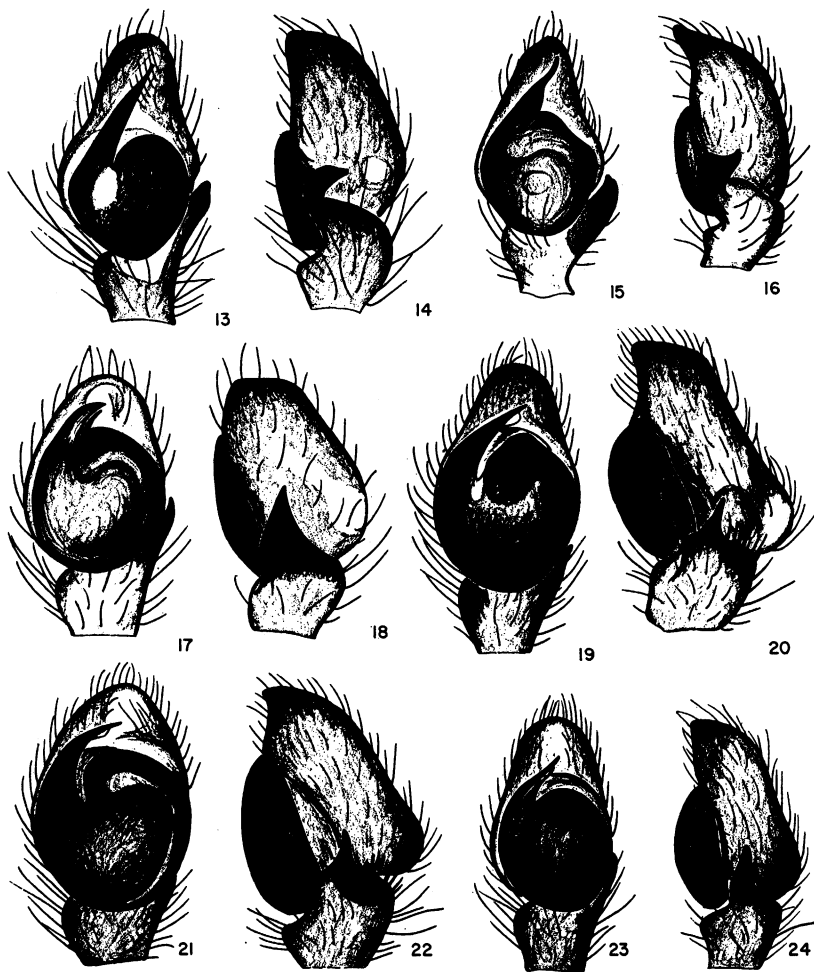
Coloration and general appearance as in most members of the genus. Carapace and abdominal scutum chestnut colored, with much black shading. Abdomen nearly black, with inconspicuous lighter dots and flecks. Legs generally colored like the abdomen but with more light flecks. Coxae and trochanters lighter than rest of legs. Sternum rather distinctly uniform chestnut, without much gray or black. Venter of abdomen similar to dorsum except for slightly more light-colored flecks.

Eyes typical in shape, color, and position. Anterior row shorter (0.27 mm.) than posterior (0.33 mm.) and both rows nearly straight, the anterior being only slightly recurved. Posterior medium eye oval and slightly narrower than the other eyes. Ocular quadrangle longer (0.20 mm.) than broad (0.14 mm.), with sides parallel. Carapace widest between second and third coxae, narrowing at the clypeus to about one-third of the greatest width (32/11). Chelicerae with three teeth on promargin; none on retromargin of fang furrows. Labium longer than wide, 1.10 mm. long, 0.80 mm. wide. Maxilla 0.68 mm. long, 0.28 mm. wide. Sternum broadly oval, 1.20 mm. long, 0.90 mm. wide.

Legs 4123. Tarsi scopulate beneath. Legs sparsely set with scattered spines. All tarsi and first and second metatarsi spineless. Femora with two or several spines usually dorsal in position. Third and fourth metatarsi with several pairs of spines. Scutum about as wide as base of abdomen and half as long as abdomen.

Palpus of same general appearance as in *subterraneus* and related species, with narrow, pointed, and curved embolus and two blunt leaf-like processes at distal end of bulb. Tibial apophysis extends less than half or the length of the cymbium, evenly tapering to the tip, with only a suggestion of sinuosity (fig. 2).

FEMALE: Total length, 4.56 mm. Carapace 1.76 mm. long, 1.28 mm. wide. Abdomen 2.80 mm. long, 1.28 mm. wide.



FIGS. 13-14. *Pellenes washonus*, new species. 13. Left palpus, ventral view. 14. Left palpus, retrolateral view.

FIGS. 15-16. *Pellenes shoshonensis* Gertsch. 15. Left palpus, ventral view. 16. Left palpus, retrolateral view.

FIGS. 17-18. *Pellenes levii*, new species. 17. Left palpus, ventral view. 18. Left palpus, retrolateral view.

FIGS. 19-20. *Pellenes wrighti*, new species. 19. Left palpus, ventral view. 20. Left palpus, retrolateral view.

FIGS. 21-22. *Pellenes apacheus*, new species. 21. Left palpus, ventral view. 22. Left palpus, retrolateral view.

FIGS. 23-24. *Pellenes limatus* Peckham and Peckham. 23. Left Palpus, ventral view. 24. Left palpus, retrolateral view.

General appearance as in the male, but no scutum is present, and the color is generally more grayish than chestnut. Coxae and sternum more nearly concolorous with the rest of the legs. Venter lighter in color than in male and with border of epigynum distinctly outlined in black. Area around spinnerets nearly concolorous with dorsum. Tarsi generally lighter in color. Metatarsi light in color on tarsal end, grading to darker on tibial end.

Carapace proportionately more slender than in the male. Labium 0.33 mm. long, 0.26 mm. wide. Maxilla 0.63 mm. long, 0.25 mm. wide. Sternum 1.04 mm. long, 0.80 mm. wide.

Epigynum as illustrated in figure 3, the details essentially as in *subterraneus*, *hentzi*, and related species. Anterior foveae of epigynum widely separated as in *hentzi* but somewhat smaller.

TYPE LOCALITY: Male holotype and female allotype from the base of Signal Mountain, beside the Snake River, at Moran, Wyoming, August 16, 1950 (D. C. Lowrie), in the collection of the American Museum of Natural History.

OTHER LOCALITY: Mouth of Moran Creek, Jackson Lake, Wyoming, female paratype (D. C. Lowrie).

This species belongs to the *subterraneus* group of *Zelotes* and is closely allied in appearance and features to the typical members. It is distinct from *subterraneus* in the somewhat smaller size and in the details of the genitalia. The embolus of the male palpus is turned sharply dorsad when seen in lateral view and is slightly curved at the tip. The foveae of the epigynum are smaller, less strongly sclerotized, and proportionately more widely separated than in *subterraneus*.

## FAMILY CLUBIONIDAE

### *Micaria tetonia* Levi and Levi

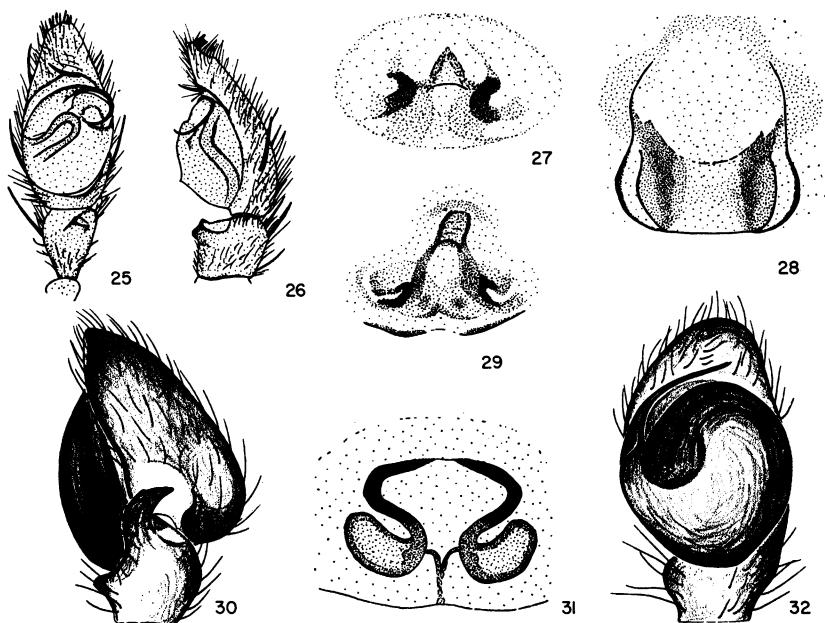
#### Figure 31

*Micaria tetonia* LEVI AND LEVI, 1951, Zoologica, vol. 36, p. 228, figs. 21-22.

FEMALE: Total length, 4.9 mm. Carapace 1.8 mm. long, 1.4 mm. wide. Abdomen 3.1 mm. long, 2.2 mm. wide. Sternum 1.1 mm. long, 0.8 mm. wide.

Coloration as in the male except that the legs are light brown rather than yellow in color, the endites are lighter brown than the sternum and labium, and the abdomen exhibits a pair of light chevrons just anterior to the middle of the abdomen.

Carapace as in the male except that it is highest and widest between the second and third coxae, rather than between the third and fourth.



FIGS. 25-26. *Apollophanes patricia*, new species. 25. Right palp, ventral view. 26. Right palp, retrolateral view.

FIG. 27. *Pellenes wrighti*, new species, epigynum.

FIG. 28. *Apollophanes patricia*, new species, epigynum.

FIG. 29. *Pellenes levii*, new species, epigynum.

FIG. 30. *Pellenes crandalli*, new species, left palp, retrolateral view.

FIG. 31. *Micaria tetonia* Levi and Levi, epigynum.

FIG. 32. *Pellenes crandalli*, new species, left palp, ventral view.

Clypeus slightly higher (0.09 mm.) than the posterior lateral eye is wide (0.08 mm.). Anterior median eyes smallest (0.05 mm.), posterior laterals the largest, others in between (0.07 mm.). Short diameter of oval posterior medians about the diameter of anterior medians. Both eye rows procurved. Anterior medians about a diameter (0.05 mm.) apart and lack touching the laterals by about 0.02 mm. Posterior medians about their long diameter apart. Median ocular quadrangle slightly longer (0.21 mm.) than wide (0.19 mm.), and wider behind than in front (0.16.). Abdomen not constricted.

Epigynum as illustrated in figure 31.

First leg: femur, 1.37 mm.; patella, 0.65 mm.; tibia, 0.90 mm.; metatarsus, 0.80 mm.; tarsus, 0.82 mm.; total, 4.54 mm.

OTHER LOCALITY: Female from region of Pilgrim Creek, near Moran, Wyoming, July 12, 1950 (D. Lowrie).

This is apparently the female of the species described by Levi and Levi. It agrees well in general aspect with the male and has a distinctive epigynum which readily separates it from others in the genus.

## FAMILY THOMISIDAE

### *Apollophanes francesca*, new species

#### Figures 6-8

MALE: Total length, 6.8 mm. Carapace 3.0 mm. long, 2.5 mm. wide, 0.9 mm. in front. Abdomen 3.8 mm. long, 2.3 mm. wide.

Integument of carapace yellowish, with a speckled aspect, the sides darker. Eyes ringed with black, the median eye area and clypeus dusky. Carapace with a narrow marginal seam, the sides with irregular maculations and vein-like radiating lines and spots from the region of cephalic groove. One rather prominent dark line from between eyes nearly to median groove and another from rear of groove down posterior declivity nearly to margin of carapace. Legs generally sparsely to thickly spotted with black, with tendency towards coalescence of spots at ends of femora, tibiae, and metatarsi.

Abdomen generally dark, with scattered light spots and with a central lanceolate cardiac mark somewhat darker than surrounding dorsal surface. Venter light on the sides, with a central dark stripe from epigastric furrow to spinnerets and a narrower stripe of darker pigment in front of the epigastric furrow extending to the pedicel.

First eye row much narrower than the second (0.76 mm./1.20 mm.), recurved, the eyes subequal in size (0.13 mm.), the median separated by a little more than the diameter, scarcely half as far from the laterals. Posterior eye row recurved, the eyes subequidistantly spaced, the median (0.10 mm. in diameter) nearer the larger anterior laterals than to the larger posterior lateral eyes (0.15 mm. in diameter). Median ocular quadrangle slightly wider than long (0.49 mm./0.47 mm.), the front eyes larger. Clypeus about three times as high (0.37 mm.) as the diameter of the anterior lateral eye.

First leg: femur, 4.6 mm.; patella, 1.6 mm.; tibia, 4.3 mm.; metatarsus, 4.2 mm.; and tarsus, 2.2 mm.; total, 16.9 mm. Tibia and patella of fourth leg 5.4 mm. long. First leg with three pairs of ventral spines, the apical pair weak, and with a single prolateral and retrolateral spine in apical third.

Male palpus as illustrated in figures 6 and 7.

FEMALE: Total length, 9.0 mm. Carapace 3.2 mm. long, 2.8 mm. wide, 0.8 mm. in front. Abdomen 5.8 mm. long, 4.2 mm. wide.

Integumental pattern essentially as in male but distinctly lighter in color so that only the dark dots break up the general yellowish color. Dark spots around bases of femoral spines as in male, but in addition prominent dark patches around bases of nearly all spines. Ventral surface of abdomen lighter than dorsal and with only a suggestion of the dark median stripe of the male.

Both eye rows distinctly recurved, the anterior row with the medians smaller in diameter (0.13 mm.) than the laterals (0.14 mm.). Posterior median eyes slightly wider apart (0.29 mm.) than their distance from laterals (0.27 mm.). Anterior median eyes more than three times as far apart (0.23 mm.) as they are from anterior laterals (0.07 mm.). Anterior eye row narrower (0.82 mm.) than posterior (1.25 mm.). Ocular quadrangle wider (0.58 mm.) than long (0.50 mm.) and narrower in front. Clypeus (0.44 mm.) about three times as high as diameter of anterior lateral eyes.

Leg formula 2413, the first and fourth legs subequal. First leg: femur, 3.5 mm.; patella, 1.5 mm.; tibia, 3.2 mm.; metatarsus, 2.6 mm.; and tarsus, 1.5 mm.; total, 12.3 mm. Tibia and patella of fourth leg, 4.5 mm. long. Spine arrangement as in male.

Epigynum as illustrated in figure 8.

TYPE LOCALITY: Male holotype, female allotype, and paratype from Cedar Groove, 4633 feet, Kings River Canyon, Tulare County, California, July 16, 1952 (M. Cazier, W. J. Gertsch, R. Schrammel).

This species is very close to *texanus* but can easily be separated on the basis of the genitalia. The tibial apophysis is much longer and more pointed at the apex. The cymbium is much longer than broad and extends beyond the distal curvature of the embolus to a distance of about two-fifths of the total length. The suboval bulb is proportionately longer than in *texana*, and the embolus originates well beyond the middle on the prolateral side. All elements of the palpus are shorter in *texana*, and embolus originates at or behind the middle of the bulb on the prolateral side.

*Apollophanes margareta*, new species

Figures 10-12

MALE: Total length, 6.4 mm. Carapace 3.2 mm. long, 3.0 mm. wide, 1 mm. in front. Abdomen 3.6 mm. long, 2.3 mm. wide.

General appearance is of a dark brown spider with dusky spots and streaks and a few lighter tan streaks. Femora and patellae of legs with dusky streaks, the other segments covered with dusky spotting. Cephalo-



thorax generally brown, abdomen mainly dusky. Carapace mainly brown, with radiating darker streaks from center to an irregular slightly darker border. Abdomen dusky above, the venter with irregular dusky spots generally without distinct pattern. Sternum spotted.

First row of eyes narrower than the second (0.8 mm./1.2 mm.), distinctly recurved, the median, separated by the full diameter, half as far from the lateral eyes which are larger (0.15 mm./0.13 mm.). Posterior eye row recurved, the median eyes separated by two and one-half diameters, about two diameters from the slightly larger lateral eyes. Median ocular quadrangle broader than long (0.55 mm./0.38.), narrowed in front in about the same ratio, the eyes subequal in size. Clypeus 0.43 mm. in height, equaling nearly three diameters of an anterior lateral eye.

Leg formula 2143, the second and first legs subequal in length. First leg: femur, 4.3 mm.; patella, 1.5 mm.; tibia, 3.8 mm.; metatarsus, 2.4 mm.; and tarsus, 2.0 mm.; total length, 15.0 mm. Second leg: tibia, 4.3 mm.; total length, 15.4 mm. Third leg: tibia, 3.7 mm.; total length, 14.4 mm. Fourth leg: tibia, 3.8 mm.; total length, 14.8 mm.

Male palpus as illustrated in figures 10 and 11.

FEMALE: Total length, 9.2 mm. Carapace 3.4 mm. long, 3.3 mm. wide, 1.0 mm. in front. Abdomen 6.3 mm. long, 4.4 mm. wide.

General appearance essentially as in male but abdomen with a more distinct pattern. Darker markings of legs much more extensive, coalescent, giving a darker appearance, particularly to the more distal parts of the legs. Light streaks on the femora pronounced. Dorsum of abdomen with a lanceolate dark mark surrounded by a lighter larger foliate area which grades into a darker border at the sides. Venter of abdomen generally lighter, with spots becoming discrete and even disappearing near the center.

Eyes essentially as in the male, the posterior row wider (1.32 mm.) than the anterior (0.87 mm.). Median ocular quadrangle wider (0.62 mm.) than long (0.57 mm.). Clypeus (0.57 mm.) nearly four times as high as the posterior lateral eye.

Leg formula probably 2143, but first leg is missing. Second leg: femur, 4.1 mm.; patella, 1.6 mm.; tibia, 3.8 mm.; metatarsus, 2.8 mm., and tarsus, 1.8 mm.; total length, 14.1 mm. Fourth leg: tibia, 3.0 mm.; total length, 11.7 mm.

Epigynum as illustrated in figure 12.

TYPE LOCALITY: Male holotype from Thompson Falls, Montana, June 26-30, 1950 (B. Malkin).

OTHER LOCALITIES: Female allotype, Sulphur Dam, Jemez Canyon, New Mexico, July 17, 1950 (M. Cazier). Male paratype, Clarks Peak,

4500 feet, Cabinet National Forest Montana, July 4, 1950 (B. Malkin).

The short embolus, which originates near the apical end of the bulb on the prolateral side, distinguishes this very distinct species from any other. The tibial apophysis is proportionately shorter but presents the bifid appearance of that process in *texana* and *margareta*.

*Apollophanes patricia*, new species

Figures 25, 26, 28

MALE: Total length, 7.00 mm. Carapace 3.10 mm. long, 2.90 mm. wide. Abdomen 3.75 mm. long, 2.30 mm. wide.

Carapace yellowish brown in base color, the sides reticulated with darker brown, the median longitudinal pale stripe indistinct. Median pale stripe largely masked in front by brown markings which cover the eye area, often distinct behind to the caudal margin, with a median dark line from obsolete median groove to the eyes and a U-shaped dusky maculation in front of the groove. Clothing of carapace many fine procumbent hairs. Sternum light yellowish brown, stippled with dusky brown. Legs quite uniform light brown, with fairly uniform dusky speckling. Abdomen yellowish brown to purplish brown, with a faint median darker lanceolate mark on the basal half of the dorsum, which may be distinctly margined with yellow.

First row of eyes recurved, narrower than the second (0.8 mm./1.2 mm.), the anterior medians separated by their diameter, two-thirds as far from the subequal lateral eyes. Second eye row recurved, the posterior median separated by somewhat less than three diameters, a little nearer the subequal lateral eyes. Median ocular quadrangle wider (0.57 mm.) than long (0.50 mm.), narrowed in front by about the same ratio. Clypeus sloping, 0.40 mm. high.

Leg formula 2413. First leg: femur, 4.5 mm.; patella, 1.9 mm.; tibia, 4.5 mm.; metatarsus, 3.8 mm.; and tarsus, 2.3 mm. Tibia and patella of fourth leg 6.2 mm. long. Spines of first leg: femur, prolateral and dorsal 3, retrolateral 4; tibia, dorsal and prolateral 2, retrolateral 3, ventral 2-2-2; metatarsus, prolateral and retrolateral 2, ventral 2-2.

Palpus as illustrated in figures 25 and 26.

FEMALE: Total length, 8.70 mm. Carapace 3.00 mm. long, 2.80 mm. wide.

General appearance as in the male. Carapace and abdomen with a clothing of fine filiform hairs. Eyes as in the male, subequal in size, the posterior row broader (1.2 mm.) than the anterior (0.8 mm.). Posterior eyes about equidistantly spaced. Median ocular quadrangle wider (0.55

mm.) than long (0.44 mm.), narrowed in front in the same ratio. Clypeus sloping, 0.52 mm. high.

First leg: femur, 3.8 mm.; patella, 1.6 mm.; tibia, 3.4 mm.; metatarsus, 2.7 mm.; tarsus, 1.8 mm. Tibia and patella of fourth leg, 4.6 mm. Spines of first leg: femur, dorsal and prolateral 3, retrolateral 1; tibia, dorsal and retrolateral 2, prolateral 3, ventral 2-2-2; metatarsus, prolateral and retrolateral 2, ventral 2-2.

Epigynum as illustrated in figure 28.

TYPE LOCALITY: Male holotype from Death Canyon, Grand Teton National Park, Wyoming, August 6, 1950 (D. C. Lowrie). It was found on a rock in a rock slide along a trail in Death Canyon, which is at about 7500 feet in altitude.

OTHER LOCALITIES: Female allotype, male and female paratypes, Many Glaciers, Glacier National Park, Montana, in talus of moraine, 5000 feet, July 14, 1953 (H. Levi); male paratype, Lincoln Pass, above Sperry Chalet, 7000 feet, Montana, July 31, 1954 (H. Levi). Female paratype, Blue Nose Peak, Lemhi County, Idaho, August 13, 1933 (W. L. Jellison).

This interesting species is best separated by the details of the genitalia. The tibia of the male palpus lacks a conspicuous apical spine and has instead a cup-like ridge extending out from the sides.

## FAMILY SALTICIDAE

### GENUS *PELLENES* SIMON

*Pellenes* SIMON, 1876, *Arachnida de France*, vol. 3, p. 90. PECKHAM AND PECKHAM, 1900, *Bull. Wisconsin Nat. Hist. Soc.*, vol. 1, p. 195. SIMON, 1903, *Histoire naturelle des araignées*, vol. 2, pp. 662, 666, 670. PECKHAM AND PECKHAM, 1909, *Trans. Wisconsin Acad. Sci.*, vol. 16, p. 528. PETRUNKEVITCH, 1911, *Bull. Amer. Mus. Nat. Hist.*, vol. 29, p. 680. REIMOSER, 1919, *Abhandl. Zool.-Bot. Gesell. Wien*, vol. 10, p. 113. BRYANT, 1941, *Psyche*, vol. 58, p. 139 (part). KASTON, 1948, *Connecticut State Geol. Nat. Hist. Surv. Bull.*, no. 70, p. 462.

*Evarcha* SIMON, 1902, *Ann. Soc. Ent. France*, vol. 71, p. 397; 1903, *Histoire naturelle des araignées*, vol. 2, p. 708. KASTON, 1948, *Connecticut State Geol. Nat. Hist. Surv. Bull.*, no. 70, p. 469.

*Habronattus* F. P.-CAMBRIDGE, 1901, *Biologia Centrali-Americana, Araneida*, vol. 2, p. 241. BRYANT, 1941, *Psyche*, vol. 58, p. 139. KASTON, 1948, *Connecticut State Geol. Nat. Hist. Surv. Bull.*, no. 70, p. 463.

GENOTYPES: Of *Pellenes*, *Aranea tripunctatus* Walckenaer; of *Evarcha*, *Aranea flammata* Clerck; of *Habronattus*, *Habrocestum mexicanum* Peckham and Peckham.

The generic name *Pellenes* was used by Eugene Simon and the Peck-

hams in the broad sense to include a large number of small jumping spiders from the temperate regions of both the Old and the New Worlds. Nearly 30 species occur in the Palearctic region. In these the ocular quadrangle is almost two-thirds as long as broad and usually at least slightly wider behind. The leg formula is typically 1342, the first leg often being incrassated and variously fringed as well as being longer. The third leg is moderately to considerably longer than the fourth, with the index of difference usually clearly evident in a comparison of the combined patella and tibia of each of the legs. Only 12 North American species conform closely with those from Europe, whereas as many as 70 or 80 others are at present referred to the genus *Habronattus* F. P.-Cambridge. As will become clear during the following discussion, the genus *Pellenes* represents only that segment of the entire supergenus in which there is a seeming fusion of the conductor and embolus into a single element. As can be seen from a study of the lateral views of the several palpi, the cymbium is suboval in general form and often presents enlargements and modifications at the base adjacent to the tibial apophysis.

For the most part, as compared with *Habronattus*, the species of *Pellenes* are somewhat more elongate, darker in coloration, and show few striking modifications of the legs, particularly of the third pair. Their center of distribution is more northern, with a modest number from the mountains and boreal zones of North America and a much larger, more varied series from the mountains of Europe and northern Asia. Very closely allied are the species of *Evarcha* which, at most, seem to represent only a subgenus of *Pellenes*. The leg formula in *Evarcha falcata* Clerck is 1342 in the male and 3412 in the female, but the length difference in the third and fourth pairs is not great. Why Simon should separate these genera into separate groups (*Evarcha* in the Hylleae and *Pellenes* in the Aelurilleae) is inexplicable when the prime characters are appreciated. The spiders are similar, and the correspondence in genitalia is very close. The palpi of *Evarcha* present the double elements in the apical division of the bulb and differ only in having a more or less prominent angle at the base of the bulb. The embolus and conductor in *Evarcha falcata* Clerck are about equal in length and size and lie closely joined together, whereas in *E. arcuata* Clerck the embolus is greatly thickened and largely masks the paler, apically visible conductor. *Evarcha* represents a distinct species group derived from the same stock giving rise to *Pellenes* in the restricted sense.

One of the best-known species of *Pellenes* is the genotype, *P. tricuspidatus* Walckenaer, which occurs over much of Europe and in the north from England and Scandinavia into Siberia. The palpus is seemingly one

of the most complicated in the whole series. The embolus is a thin spine hidden in a groove on a very broad, apically rounded conductor, which probably has often been mistaken for the embolus itself. The tibial apophysis is a long, thin blade closely appressed to the cymbium and over which has partially grown two prominent back cymbial teeth or spurs. One of the American species, *Pellenes laggani* Emerton, has a palpus quite similar in design but lacks the prominent cymbial teeth. Another American species, *Pellenes montanus* Emerton, parallels so closely the north European *Pellenes lapponicus* Sundevall in palpal detail that the possible identity should be investigated. *Pellenes montanus* is known only from a few examples from the mountains near Banff, Alberta, and from near Denver, Colorado. The European counterpart lives on the high mountains and in northern areas of that continent.

Many of the European species have palpi similar in design to those of the American *Pellenes limatus* Peckham and Peckham and its congeners. These are average species of the group and feature the seeming fusion of the embolus and conductor. However, the double character of this element is usually clearly apparent. In *Pellenes levii* (fig. 17) the conductor is a small, thin spine at the base of the heavy, slightly curved embolus. The conductor is largely fused to the embolus and evident as a paler sclerite, which forms a slight process near the apex of the embolus, in *limatus* (fig. 23), *wrighti* (fig. 19), and *apacheus* (fig. 21). The double character of the presumed embolus is somewhat less evident in such species as *washonus* (fig. 13) and *shoshonensis* (fig. 15).

The palpus of *Pellenes crandalli*, new species (fig. 32), presents no features that would exclude it from *Habronattus* F. P.-Cambridge, but the aspect of the species is that of typical *Pellenes*. The embolus and conductor are closely appressed together for almost their entire length but retain their identity as quite separate elements.

The generic name *Habronattus* F. P.-Cambridge, was placed in synonymy with *Pellenes* by Simon and so regarded by the Peckhams. It was revived in 1941 by Bryant for the very large series of American species in many of which the first and third legs are bedecked with hairy fringes, modified scales and spines, or embellished with various structural changes. In this series the leg formula for both sexes is almost always 3412. The cymbium of the male palpus is more or less circular, quite flattened, to form a cup for the transversely developed bulb and apical processes. The embolus is a black spine of variable length, which is invariably associated with a similar but ordinarily much shorter conductor. In some species (*americanus*, *borealis*, etc.) the embolus, which originates at the base of the bulb on the prolateral side, is a gently curved spine which fits in a

groove along the apical end of the cymbium, essentially as in *Pellenes crandalli*, new species. At the other extreme is *hirsutus* in which the embolus makes more than a full revolution. The center of this subgenus is North America.

In summary, then, it seems clear that the group described above was derived from a single stock in which the two elements of the apical division of the bulb were discrete. An average or median type of palpus is represented by that of *Pellenes crandalli* or *Pellenes (Habronattus) americanus*. Palpal specilization has moved in two directions: (1) towards a shortening and an eventual fusion of the embolus and conductor into a single piece; (2) the lengthening of the embolus so that the conductor becomes increasingly less important and more remote from the tip of the embolus.

The genus is such a subjective category that its definition can fit appropriately species groups of all grades of size and of many degrees of structural and temporal remoteness. The numerous species of the supergenus *Pellenes* fall into several distinct species groups, so that a graph based on prime characters would show a clustering of the species around certain centers. One of these centers is *Evarcha*, but its separateness is based on trivial palpal features. Each of the principal species clusters seems to be bridged by one or several species. Therefore it seems desirable to regard these species groups as being merely subgenera and return to the broader genus of Simon and the Peckhams.

All of the following North American species, which include five described as new, belong to the subgenus *Pellenes*.

*Pellenes montanus* Emerton

*Habrocestum montanum* EMERTON, 1894, Trans. Connecticut Acad. Sci., vol. 8, p. 420, pl. 1, figs. 6-6d.

*Pellenes montanus* PECKHAM AND PECKHAM, 1909, Trans. Wisconsin Acad. Sci., vol. 16, p. 562, pl. 47, figs. 9-9c.

TYPE LOCALITY: Male and female cotypes from Laggan, Alberta, collected by Bean, in the Museum of Comparative Zoölogy and the American Museum of Natural History. Those in the American Museum are dried and still on insect pins.

*Pellenes laggani* Peckham and Peckham

*Pellenes laggani* PECKHAM AND PECKHAM, 1909, Trans. Wisconsin Acad. Sci., vol. 16, p. 560, pl. 49, figs. 2-2a.

TYPE LOCALITY: Male and female cotypes from Glacier, British Columbia, and Laggan, Alberta, presumably in the Museum of Comparative Zoölogy.

*Pellenes longimanus* Emerton

*Pellenes longimanus* EMERTON, 1913, Bull. Amer. Mus. Nat. Hist., vol. 32, p. 258, pl. 48, figs. 9-9c (male). KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 462, pl. 91, figs. 1695-1697.

TYPE LOCALITY: Male type from Lakehurst, New Jersey, in the American Museum of Natural History.

*Pellenes limatus* Peckham and Peckham

Figures 23, 24

*Pellenes limatus* PECKHAM AND PECKHAM, 1901, Bull. Wisconsin Nat. Hist. Soc., vol. 1, p. 217, pl. 1, fig. 7; 1909, Trans. Wisconsin Acad. Sci., vol. 16, p. 561, pl. 48, fig. 2.

*Pellenes townsendi* PECKHAM AND PECKHAM, 1901, Bull. Wisconsin Nat. Hist. Soc., vol. 1, p. 218, pl. 1, fig. 9 (female).

TYPE LOCALITIES: Male type of *P. limatus* from California; female type of *P. townsendi* from Texas; both presumably deposited in the Museum of Comparative Zoölogy.

*Pellenes peninsularis* Emerton

*Pellenes peninsularis* EMERTON, 1925, Canadian Ent., vol. 57, p. 68, figs. 6a-6c.

TYPE LOCALITY: Male holotype from Barrington, Nova Scotia, in the Museum of Comparative Zoölogy.

*Pellenes wrighti*, new species

Figures 19, 20, 27

MALE: Total length, 5.1 mm. Carapace 2.5 mm. long, 1.8 mm. wide. Abdomen 2.7 mm. long, 1.7 mm. wide.

General appearance as in *Pellenes apacheus*. Abdomen rather rubbed in this specimen so exact pattern is not so distinct, but the median stripe is a series of chevrons of white scales running the length of the dorsum. Sternum and legs like those of *levii*, with banding effect on legs more definite.

Area of eyes (1.02 mm. long) occupying two-fifths of carapace. Eyes of first row recurved, nearly equidistantly spaced (0.06 mm.), though the medians seem to be a trifle closer together. The medians are slightly less than their radius from the clypeal margin, nearly twice (0.44 mm.) as wide as the laterals (0.23 mm.). Eyes of the second eye row very small (0.09 mm.) and equidistant (0.25 mm.) from the first and third eye rows. Third eye row very slightly broader than the first (1.35 mm./1.33 mm.) and slightly smaller (0.21 mm.) than anterior laterals (0.23

mm.). Ocular quadrangle nearly one-third wider than long (1.35 mm./1.02 mm.).

Apophysis of tibia of palpus similar to that of *levii* but less robust, about half as long and not noticeably curved at the tip. Palpus as illustrated in figures 19 and 20.

Legs not complete but formula probably 3412. First leg: femur, 1.70 mm.; patella, 1.20 mm.; tibia, 1.30 mm.; the apical segments missing. Tibia and patella of third leg, 2.15 mm., of fourth leg, 1.65 mm.

FEMALE: Total length, 5.3 mm. Carapace 2.8 mm. long, 2.0 mm. wide. Abdomen 2.7 mm. 1.7 mm. wide.

General appearance as in the female of *levii*. Hairs and scales quite thick. Abdomen with a more definite white stripe than in male or in *levii*. Dark border of stripe rather general instead of appearing as short dashes. Venter generally darker in color than in *levii*.

Area of eyes (1.12 mm.) occupying two-thirds of the length of the carapace (2.80 mm.). Eye arrangements and proportions essentially as in male, except that they are slightly larger.

Leg formula 3412.

Epigynum of the same type as in other members of the genus, and as illustrated in figure 27.

TYPE LOCALITY: Male holotype from Pembroke Township, Kankakee County, Illinois, September 8, 1936 (D. Lowrie). Female allotype from Tremont, Porter County, Indiana, June 8, 1929 (Sewall Wright).

OTHER LOCALITY: Female paratype from Waukegan Flats, near beach, Lake County, Illinois, May 21, 1936 (D. Lowrie).

We are very happy to name this species for Dr. Sewall Wright whose Chicago area collection has been of much service to the first author in working on Illinois spiders.

This is the *Pellenes* species referred to in papers by D. C. Lowrie (1942, Bull. Chicago Acad. Sci., vol. 6, no. 9, p. 168; 1948, Ecology, vol. 29, no. 3, p. 338). It apparently is not common in the Chicago area.

*Pellenes apacheus*, new species

Figures 21, 22

MALE: Total length, 5.0 mm. Carapace 2.5 mm. long, 1.8 mm. wide. Abdomen 2.5 mm. long, 1.5 mm. wide.

Carapace black, with a slight reddish cast on the sides, the ocular region jet black, with some iridescence, the entire carapace thinly clothed with procumbent yellowish scales. Sternum dusky, set with long gray hairs. Labium and maxillae dusky red brown, with gray hairs. Chelicerae bright reddish brown. Legs yellowish to dark brown, the first leg dark-



est, the others variegated with brown spotting, the clothing a few white scales and erect black setae. Palpus with femur blackish at base, the apex of femur and patella yellowish, the tibia and tarsus reddish brown, rather thinly set with white scales and erect black setae. Abdomen mostly black above, showing only a faint pattern of chevrons, clothed with gray scales and set with erect black setae. Venter of abdomen black on the sides, with a broad gray stripe from base to spinnerets, clothed with inconspicuous hairs and scales.

Structure in close agreement with that of *limatus* and *wrightii*. Third eye row (1.30 mm.) slightly wider than the first (1.22 mm.). Legs typically spined, the first tibia with three pairs, the first metatarsus with two pairs, of ventral spines. First leg: femur, 1.50 mm.; patella, 1.10 mm.; tibia, 1.10 mm.; metatarsus, 0.75 mm.; and tarsus, 0.55 mm. long. Tibia and patella of third leg, 1.80 mm., of fourth leg, 1.50 mm. long. Leg formula 3142, the first and third legs subequal in length.

Palpus as illustrated in figures 21 and 22.

TYPE LOCALITY: Male holotype from McKay's Peak, White Mountains, Arizona, July 10-15, 1940 (W. J. Gertsch and L. Hook).

The all-black carapace, which lacks the usual pale bands of most species of the genus, and similarly nearly unmarked abdomen, distinguish this species from its relatives. The palpus has a heavy, conical tibial apophysis and a broad bulb with a heavy curved embolus. From *Pellenes wrightii* this species can be distinguished by the much shorter legs and by the details of the palpus.

*Pellenes levii*, new species

Figures 17, 18, 29

MALE: Total length, 4.2 mm. Carapace 2.2 mm. long, 1.6 mm. wide. Abdomen 2.3 mm. long, 1.5 mm. wide.

Integument of carapace brown to black, clothed with white and brown scales and many setae in the cephalic region. Clypeal region with reddish brown scales, especially around ventral rim of anterior median eyes. Two rather faint stripes of white scales on the dark brown integument extending from posterior lateral eyes in a slight curve towards the posterior edge of the carapace. Abdomen generally black, with a narrow center stripe of white scales and lateral oblique stripes of white, giving the sides a white and black striped effect. Venter of abdomen generally white, with some brownish markings and the black of the sides showing laterally. Sternum dark brown. Coxae and trochanters of first and second legs dark brown, especially the first, those of third and fourth legs a dusky tan color. Rest of legs dark brown or black in color, especially the first and

second legs. Tarsus of first legs and tarsi and metatarsi of other legs brown in color. Third and fourth femora with basal half light brown, distal half dark brown as well as the rest of the legs.

Area of eyes (0.93 mm. long) occupying two-fifths of the length of the carapace. Eyes of first row recurved, equidistantly spaced (0.06 mm. apart), the medians about half of a diameter from the clypeal margin (0.18 mm.), nearly twice (0.35 mm.) as large as the laterals (0.19 mm.). Small eyes of the second row midway between the two rows. Third row of eyes very slightly broader than the first (1.2 mm./1.1 mm.), the eyes the same size as the anterior laterals. Ocular quadrangle nearly one-third wider than long (1.20 mm./0.93 mm.).

Details of left palpus as illustrated in figures 17 and 18. Palpus thickly overlain above with white scales. Patella nearly twice as long as tibia, the latter with a heavy pointed apophysis only slightly longer than broad at base, without a hook at the tip, only a slight curve.

Leg formula 3412, with third and fourth legs virtually the same length. No very striking differences between the legs except that first leg is nearly black and stouter than the others. First leg: femur, 1.20 mm.; patella, 0.75 mm.; tibia, 0.75 mm.; metatarsus, 0.65 mm.; and tarsus, 0.50 mm. Tibia and patella of third leg, 1.50 mm., of fourth leg, 1.30 mm.

FEMALE: Total length, 6.1 mm. Carapace 2.6 mm. long, 1.8 mm. wide. Abdomen 3.3 mm. long, 2.2 mm. wide.

Integument of carapace and spine and scale arrangement similar to that of male except for the clypeus which is clothed with white scales. Abdominal markings similar to those of male though the general impression is of a grayish color rather than black. The central grayish stripe is bordered by a series of dark dashes, and each of the lateral light oblique stripes is bordered by a darker stripe. Venter, legs, and sternum essentially as in male, except that the coloration in this female is much lighter generally.

Area of eyes occupying two-fifths of the length of the carapace (1.1 mm./2.6 mm.). Eye arrangements and proportions essentially as in male, except that they are slightly larger.

Leg formula as in male and no striking difference between legs.

Epigynum as in other members of the genus, and as illustrated in figure 29.

TYPE LOCALITY: Male holotype and female allotype from beneath rocks on hillside, Uhl Hill, east of Moran, Wyoming, June 25, 1950 (D. Lowrie). Female paratype from same locality, July 17, 1950 (D. Lowrie).

*Pellenes crandalli*, new species

Figures 30, 32

MALE: Total length, 6.7 mm. Carapace 2.9 mm. long, 2.1 mm. wide. Abdomen 3.5 mm. long, 1.8 mm. wide.

General appearance of entire spider similar to that of *Pellenes peninsularis* Emerton and relatives. Carapace dark brown to black on the sides, with the eye area black, and with a median dark stripe from the eyes to the caudal edge over the pedicel and on each side of which is a paler, orange-brown stripe. Clothing of carapace somewhat rubbed, but an inconspicuous stripe of white scales runs on each side from the anterior lateral eyes back over the pale bands to the margin. Rest of carapace with a few darker scales and long bristles, the latter especially numerous over the eyes, and with numerous orange scales on clypeus and between eyes of first row. Sternum and coxae pale yellowish brown. Labium and maxillae dark reddish brown, apically tipped in white. Chelicerae dark reddish brown. First pair of legs nearly black, the others dark brown, somewhat mottled, all pairs clothed with white scales, erect black setae and heavier spines. Tarsus of palpus dark reddish brown, the basal segment yellowish, all segments very thinly covered with white scales and a few black setae. Abdomen mostly dark brown, the dorsum with a linear median pale stripe the length, the sides with a white stripe from base to spinnerets, and the venter pale yellow; dark markings thickly pointed with paler spots. Clothing of abdomen rubbed off but probably consisting of scales of similar color to the basic pattern.

Eye quadrangle (1.1 mm. long) occupying two-fifths of the length of carapace. Eyes of first row typically recurved, close together, the median twice as large as the lateral, their radius from the clypeal edge. Small eyes of second row situated midway between those of first and third row. Third eye row wider (1.65 mm.) than the first (1.45 mm.), the lateral eyes subequal in size.

Legs typically spined, the first tibia with 1-2-2, the metatarsus with 2-2, ventral strong black spines. First leg: femur, 1.75 mm.; patella, 1.25 mm.; tibia, 1.30 mm.; metatarsus, 0.80 mm.; and tarsus, 0.65 mm. Tibia and patella of third leg, 2.10 mm., of fourth leg, 1.85 mm. Leg formula 1342, the first leg longest, heavy, the femur, patella, and tibia thickened.

Details of palpus as illustrated in figures 30 and 32.

TYPE LOCALITY: Male holotype from Atascosa Mountain, Arizona, October 10, 1937 (R. H. Crandall).

This pretty species is readily differentiated from its relatives by its

larger size and distinct palpus. The embolus, which originates at the middle of the prolateral side of the bulb, curves gently forward along the cymbial groove to end in an apical fovea. Closely appressed to it is the conductor which is clearly separated from the base to the tip. The tibial apophysis is a heavy, black hook with curves dorsad.

*Pellenes washonus*, new species

Figures 13, 14

MALE: Total length, 5.5 mm. Carapace 2.5 mm. long, 1.8 mm. wide. Abdomen 2.7 mm. long, 2.0 mm. wide.

Integument of carapace dark brown, darkest on the sides, the eye quadrangle black, the entire carapace overlain with a quite thick covering of grayish scales through which little of the dark integument shows. Clypeus more sparsely clothed with scales and long hairs. Pars cephalica with a series of long bristles, especially over the front eyes. Abdomen dusky brown, the dorsum margined with paler bands and with faint, narrow chevrons in apical half, the venter dusky. Dorsum of abdomen clothed thinly with inconspicuous, procumbent scales with a slight iridescence. Sternum dusky brown. Chelicerae dark reddish brown. Labium and maxillae dark reddish brown, the apices white. Legs pale yellowish brown, weakly annulate in brown; the legs dark brown except for paler patella. Clothing of legs a few white scales, long black bristles, and heavier spines. Palpus with tarsus dark reddish brown, with white scales and hairs, the remaining segments yellowish and thickly covered with whitish scales.

Eye quadrangle (1 mm. long) occupying two-fifths of length of carapace. Eyes of first row recurved, the median very large, twice the diameter of the laterals, and half of the diameter from the clypeal margin. Small eyes of second row situated about midway between the large lateral eyes. First and third eye rows of equal width, the quadrangle wider than long.

Legs with strong black spines, the first tibia with three pairs, the metatarsus with two pairs of ventral spines. First leg: femur, 1.70 mm.; patella, 1.25 mm.; tibia, 1.35 mm.; metatarsus, 1.10 mm.; and tarsus, 0.70 mm. Tibia and patella of third leg, 1.6 mm., of fourth leg, 1.8 mm. Leg formula 1342.

Details of palpus as illustrated in figures 13 and 14.

TYPE LOCALITY: Male holotype from Peavine, Sierra County California, July 18, 1940 (W. M. Pearce).

This very distinct species differs from relatives chiefly in the features of the palpus. The embolus is an elongated, heavy process which is drawn to a quite sharp point. The tibial apophysis is a heavy black spur which is curved dorsad as shown in the figure. The palpus shows some

similarity to that of *Pellenes dorsalis* Banks of Hermosillo, Sonora, which apparently belongs to this genus and seemingly is distinct in the different tibial apophysis. The differences between *Pellenes washonus*, new species, and *Pellenes shoshonensis* Gertsch are well illustrated in the figures.

*Pellenes dorsalis* Banks

*Habrocestum dorsalis* BANKS, 1898, Proc. California Acad. Sci., ser. 3, vol. 1, p. 287, pl. 17, fig. 12.

TYPE LOCALITY: Male type from Hermosillo, Sonora, originally deposited in the California Academy of Sciences but destroyed in the 1906 earthquake and fire.

*Pellenes shoshonensis* Gertsch

Figures 15, 16

*Pellenes shoshonensis* GERTSCH, 1934, Amer. Mus. Novitates, no. 726, p. 20, figs. 15 and 16.

TYPE LOCALITY: Male holotype from Adelaide, Idaho, in the American Museum of Natural History.

