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## A New Pliocene Woodpecker, with Comments on the Fossil Picidae

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Among the unidentified avian fossils housed in the collections of the Department of Vertebrate Paleontology, the American Museum of Natural History, we discovered a left tibiotarsus that represents a new genus and species of woodpecker. This new species and the contemporaneous *Pliopicus brodkorbi* Feduccia and Wilson are the oldest members of the Picidae recorded from the New World.

While attempting to determine the systematic position of the new woodpecker, we reviewed the status of the other fossil picids. The present paper includes several new conclusions about the relationships of some of these fossils.

### MATERIALS

### ABBREVIATIONS

A.M.N.H., Department of Vertebrate Paleontology, the American Museum of Natural History

U.M.M.P., University of Michigan Museum of Paleontology

Y.P.M., Peabody Museum of Natural History, Yale University

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FIG. 1. *Palaeonertes shorri*, A.M.N.H. No. 1641, distal end of left tibiotarsus, type specimen.  
*Upper left*: Stereophotographs of anterior view. X 4. *Lower left*: Stereophotographs of distal end.  
X 4. *Center*: View of external side. X 5. *Right*: View of internal side. X 5. Slightly retouched.

## SPECIMENS EXAMINED

Fossil species: *Pliopicus brodkorbi*, type, U.M.M.P. No. V55785; *Uintornis lucaris*, type, Y.P.M. No. 617.

Recent species: *Colaptes auratus* (1 specimen), *Celeus flavescens* (1), *Picus erythrogygius* (1), *Dryocopus pileatus* (2), *Asyndesmus lewis* (1), *Melanerpes (Tripsurus) cruentatus* (1), *M. erythrocephalus* (4), *M. flavifrons* (1), *M. formicivorus* (3), *Centurus carolinus* (3), *C. striatus* (1), *C. superciliaris* (1), *Sphyrapicus varius* (1), *Trichopicus cactorum* (1), *Dendrocopos pubescens* (3), *D. villosus* (3), *Picoides arcticus* (1), *P. tridactylus* (1).

## SYSTEMATICS

## CLASS AVES

## ORDER PICIFORMES

## FAMILY PICIDAE

## PALAEONERPES, NEW GENUS

TYPE: *Palaeonerpes shorti*, new species.

DIAGNOSIS: Distal end of left tibiotarsus differs from those of other picid genera in that (1) the external condyle in distal view projects anteriorly to level of, if not slightly beyond, the internal condyle (in other genera the internal condyle usually projects well beyond the external condyle); (2) posterior intercondylar sulcus is less deep; (3) anterior intercondylar fossa is broader and hence condyles flare (less nearly parallel) anteriorly; and (4) distal (articular) end of bone is more compressed proximodistally rather than lateromedially.

**Palaeonerpes shorti**, new species

## Figure 1

TYPE: Distal end of left tibiotarsus, A.M.N.H. No. 1641; from lower Pliocene deposits, Ogallala group (equivalent to the top of the Valentine Formation; see discussion below); Driftwood Creek, Hitchcock County, Nebraska.

DIAGNOSIS: Same characters as those given for genus; *P. shorti* is smaller than *Melanerpes erythrocephalus* but about equal in size to *Centurus carolinus*; shaft is not so slender as that of *C. carolinus*, but is heavier and more robust than in *M. erythrocephalus* and in *Asyndesmus*.

MEASUREMENTS: Breadth (lateromedial) across anterior end of condyles, 3.7 mm.; length (anteroposterior) of external condyle, 3.1 mm.; length of internal condyle, 3.2 mm. (approximate); breadth of shaft 7.5

mm., from distal end, 2.1 mm.; depth (anteroposterior) of shaft 7.5 mm., from distal end, 1.9 mm.

ETYMOLOGY: *Palaeonerpes*, ancient creeper; *shorti*, the species is named for Lester L. Short in recognition of his comprehensive studies of the family Picidae.

## DISCUSSION

### GEOLOGICAL NOTES

The late Tertiary stratigraphy of Nebraska and the adjoining states is still not completely understood. Moreover, the paucity of locality information on the label of A.M.N.H. No. 1641 does not permit accurate determination of its age; the age and locality are given as “?L. Pliocene” and “Driftwood Cr., Hitchcock Co., Neb.” The fossil tibiotarsus was collected in association with two fangs and about 90 vertebrae of a snake (A.M.N.H. No. 1639) identified as “*Crotalus* sp. und.” by Gilmore (1938, p. 73) and *C. viridis* by Brattstrom (1954, p. 38). The latter author listed the age as “?Lower Pliocene.”

According to Lugin (1939, p. 1272), “the fossil-bearing horizon on Driftwood Creek, southwest of McCook, Nebraska, seems to correlate almost exactly with the Burge channel horizon at the top of the Valentine formation in northern Nebraska. The fossil-bearing channel deposits at Driftwood Creek also occur below the ‘caprock bed’ and the *Krynitzkia* fossil seed zone, the same position as occupied by the Burge channel member of the Valentine.” The *Krynitzkia* fossil seed zone is included in the lower portion of the Ash Hollow Formation. *Palaeonerpes*, then, probably comes from deposits equivalent to the upper part of the Valentine Formation, or less likely, to the lowest part of the Ash Hollow Formation.

### RELATIONSHIPS OF *Palaeonerpes shorti*

The type of *P. shorti* is relatively well preserved, but it is abraded along the posterodistal edges of both condyles. This abrasion leads to the impression that the posterior intercondylar sulcus is very shallow. If one makes allowances for the missing portions of the condyles, then certainly the sulcus is deeper than that which is apparent in the fossil. The sulcus, however, still seems much shallower than that of most other genera and is probably a reflection of the proximodistal compression of the distal end of the bone. Because only one specimen of *P. shorti* is known, we do not want to overemphasize the nature of the sulcus as a diagnostic character. Of more importance is the noticeable anterior separation of the condyles and the anterior position of the external condyle. *Palaeonerpes* is quite distinct morphologically from the genera that we examined, and

when compared separately with each genus, additional differences can be added to those cited in the diagnosis.

It is difficult, if not impossible, to discern a pattern of similarities that indicates unequivocal affinities to any group of living woodpeckers. Our present assumptions about the phylogenetic relationships and zoogeography of New World picids (Short, MS.; Bock and Short, MS.) suggest that the affinities of *Palaeonerpes* are more likely to be with the melanerpine woodpeckers than with such groups as *Dendrocopos*, *Dryocopus*, or *Colaptes*. Indeed, *Palaeonerpes* is apparently more similar morphologically to the melanerpine woodpeckers, but the Recent forms included in that latter group (*Melanerpes*, *Centurus*, *Asyndesmus*, *Sphyrapicus*) are more similar to each other than any of them are to *Palaeonerpes*. On the other hand, it is possible that *Palaeonerpes* could represent an early stock of North American woodpeckers that was entirely distinct from the melanerpines and which eventually became extinct. Because we cannot show definite relationships to any fossil or Recent genus, we have decided to recognize *Palaeonerpes* as a separate genus.

Two fossil woodpeckers are known from upper Oligocene deposits of France (Milne-Edwards, 1867-1871, vol. 2, pp. 396-399; plate 176, figs. 1-7; plate 178, figs. 1-5). *Palaeopicus archiaci* (Milne-Edwards) and *P. consobrinus* (Milne-Edwards) are represented by complete tibiotarsi and therefore offer some comparisons with *Palaeonerpes* and Recent woodpeckers. The figures in Milne-Edwards' work are unclear, but *Palaeopicus* appears to lack the ligamental protuberances on the distoanterior surface of the shafts which are so characteristic of woodpeckers. Moreover, the posterior intercondylar sulcus is shallow and thus different from that of almost all woodpeckers except *Palaeonerpes*. In *Palaeopicus* the shape of the proximal end of the bone (seen in anterior view) is very different from that found in all living woodpeckers that we have examined (see also Lambrecht, 1933, p. 629, fig. 172). *Palaeopicus consobrinus* differs from Recent woodpeckers and *Palaeonerpes* in having the external condyle projecting far anterior to the level of the internal condyle. In *P. archiaci* the internal condyle apparently projects slightly beyond the level of the external condyle. All of these characters suggest that *Palaeopicus* is probably not referable to the Picidae. Until the types are reexamined, no reasonable opinion can be given about the affinities of this genus.

*Picus gaudryi* Depéret is known from the Miocene of France and is represented by a femur and tibiotarsus. The illustrations of *P. gaudryi* (Depéret, 1887, plate 13, figs. 53, 54) are very small, hence detailed characters cannot be discerned. The tibiotarsus does not appear to be very picid-like as the shaft is noticeably constricted near the proximal bases of the condyles. The type tibiotarsus needs to be reexamined so

that its relationships with the Picidae and with the Recent genus *Picus* can be substantiated.

Lambrecht (1933, pp. 630–631) recognized three fossil species which he placed provisionally in the Picidae. *Cryptornis antiquus* (Gervais) (see Wetmore, 1951, p. 153) is known from a skeletal impression from the Eocene of France. *Homalopus picoides* Milne-Edwards is known from a tibiotarsus, tarsometatarsus, and humerus found in middle Miocene deposits of France. The elements do not appear picid-like, but again the type will have to be reexamined. The third species, *Uintornis lucaris*, was described by Marsh (1872). It is based on the distal end of a tarsometatarsus from the Eocene (Bridger Formation) of Wyoming. Shufeldt (1915, pp. 50–52) was definite in his opinion that *Uintornis* was not a woodpecker, and subsequent examination of the type by one of us proves him correct. Although the relationships are obscure, *Uintornis* seems closest to the Cuculiformes. A redescription of the type and a discussion of the affinities of *Uintornis* will be presented at a later date (Cracraft, MS.).

Feduccia and Wilson (1967, p. 3) described a fossil woodpecker, *Pliopicus brodkorbi*, from lower Pliocene deposits of Kansas. As *Pliopicus* is very nearly contemporaneous with *Palaeonerpes*, the relationships of these two genera to each other and to living genera are especially important with regard to the late Tertiary evolution of North American Picidae.

*Pliopicus* and *Palaeonerpes* were certainly not conspecific, as the former is decidedly smaller. Moreover, the rather delicate tarsometatarsus of *Pliopicus* indicates that it was also a more slender bird and proportionally lighter in weight than *Palaeonerpes*. Hence, we conclude that these were two different types of woodpeckers, and it seems reasonable to recognize two genera.

Feduccia and Wilson (1967, p. 4) concluded that *Pliopicus* was most closely allied to the genus *Melanerpes* and listed the following shared characters as evidence of that relationship: (1) the anterior surface of the shaft is deeply grooved; (2) there is a depression at the base of trochlea III on the anterior surface of the shaft; (3) there is a bulge of the shaft at the position of the inner foramen at the proximal end of the shaft on the anterior side. We have examined skeletons of numerous genera and find that these three characters are present in many other genera, including *Centurus*, *Sphyrapicus*, and *Dryocopus* among others. (Feduccia, pers. commun., informed us that these characters were considered to be more pronounced in *Melanerpes*.) Also, these characters are variable when large series of *Melanerpes* are examined. We could find no characters that support a close relationship to *Melanerpes*. Indeed, it is our belief that *Pliopicus* is a distinct woodpecker, and we agree with Feduccia and Wil-

son that it merits generic status. In addition to the diagnostic characters listed by them (1967, pp. 3, 4), we would add that *Pliopicus* differs from other genera in having the base of the sehnenhalter situated decidedly more distally and reaching to the outer intertrochlear notch; the sehnenhalter is also slightly less twisted medially in *Pliopicus*. The trochlea for digit III is more lateromedially compressed in *Pliopicus* (as mentioned in the Feduccia and Wilson diagnosis), but the trochlea also projects distally much more, extending almost to a level with the distal end of the sehnenhalter (trochlea III of some woodpeckers sometimes extends distally quite far, but this is a result of a torsion of the distomedial side of the shaft rather than of a long trochlea). These very marked differences make it difficult to assign the relationships of *Pliopicus* to a particular group of woodpeckers.

*Bathoceleus hyphalus* has been described from Pleistocene deposits of New Providence Island, Bahamas (Brodkorb, 1959, p. 362). The relationships of this species are uncertain, and unfortunately, because it is based on a coracoid, cannot be compared with *Palaeonerpes*. It can be noted, however, that *Bathoceleus* was apparently larger than *Palaeonerpes*.

#### SUMMARY

A new genus and species of woodpecker, *Palaeonerpes shorti*, is described from a left tibiotarsus from lower Pliocene sediments of Nebraska. *Palaeonerpes* is morphologically distinct from all genera with which it was compared, and no clear evidence is present to assign *Palaeonerpes* to any genus of Recent woodpecker.

General comments on the systematic status of the known fossil picids are presented. *Palaeopicus* has several features which suggest that it probably should be excluded from the Picidae. *Uintornis* is not a woodpecker, as Shufeldt (1915) correctly surmised. *Pliopicus* is a morphologically distinct genus that does not appear related to any genus of North American woodpeckers.

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