

PEDICINUS PATAS (FAHRENHOLZ) (ANOPLURA) AND
OTHER LICE OF THE CERCOPITHECINI.

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COMPARISON of the syntypes of *Neopedicinus patas* Fahrenholz, 1916, with a paratype of *Pedicinus bilobatus* Benoit, 1962, has shown that the two are the same. What Ferris (1934, 1951) and following him many other authors including Benoit (1959) considered to be *Pedicinus patas*, is a different species and is described and named here.

The tribe Cercopithecini (Cercopithecinae, Cercopithecidae, Primates) includes the genera *Cercopithecus*, *Miopithecus*, *Allenopithecus* and *Erythrocebus* with at least 17 species in Africa, south of the Sahara. Material of *Pedicinus* from these monkeys is exceedingly rare in collections. We are indebted to P. L. G. Benoit, Tervuren; Th. Clay, London; O. S. Flint, Washington; J. A. Powell, Berkeley, who is in charge of the collection of the late G. F. Ferris, and to W. Reichmuth, Berlin, who owns the collection of the late H. Fahrenholz, for the loan of material.

The hosts given on the labels of preparations of *Pedicinus* must be considered with scepticism. The hosts have frequently been misidentified in the past. In zoos and laboratories cross-infections especially with *Pedicinus eurygaster* and *P. obtusus*, both mostly originating from Asiatic macaques, are very common. Even in dried museum-skins dead lice can easily reach one skin from another (Hopkins, 1949). And more misleading in our experience is the fact, that killed monkeys of different species are frequently transported together in the field before the skins can be searched or prepared. In these cases the body of any monkey more recently killed will attract all other living lice of other animals.

The genus *Pedicinus* has been recorded from only three known species of the Cercopithecini from the wild state, findings on museum-skins included. But if we add those *Pedicinus* that undoubtedly had come from some *Cercopithecus*—species unknown—we have a sufficient series of *Pedicinus* at hand to show, that more probably most of these monkeys are infested by one group of lice that is related to the *Pedicinus pictus*-group of the African Colobinae and to *Pedicinus ancoratus* of the Asiatic Colobinae.*

* Possibly *Pedicinus obtusus* (Rudow), normally occurring on Asiatic Cercopithecidae, may also live on *Cercopithecus aethiops*, but the material available is insufficient and contamination cannot wholly be excluded.

The first described species of this group has been *Neopedicinus patas* Fahrenheit, 1916. The description is inadequate. The genitalia of the male for instance are not mentioned at all, which has caused the later confusion about this species. Through the kindness of Dr. W. Reichmuth we have been able to remount the ten syntypes, to select a lectotype and to redescribe the species:

Pedicinus patas (Fahrenheit, 1916).

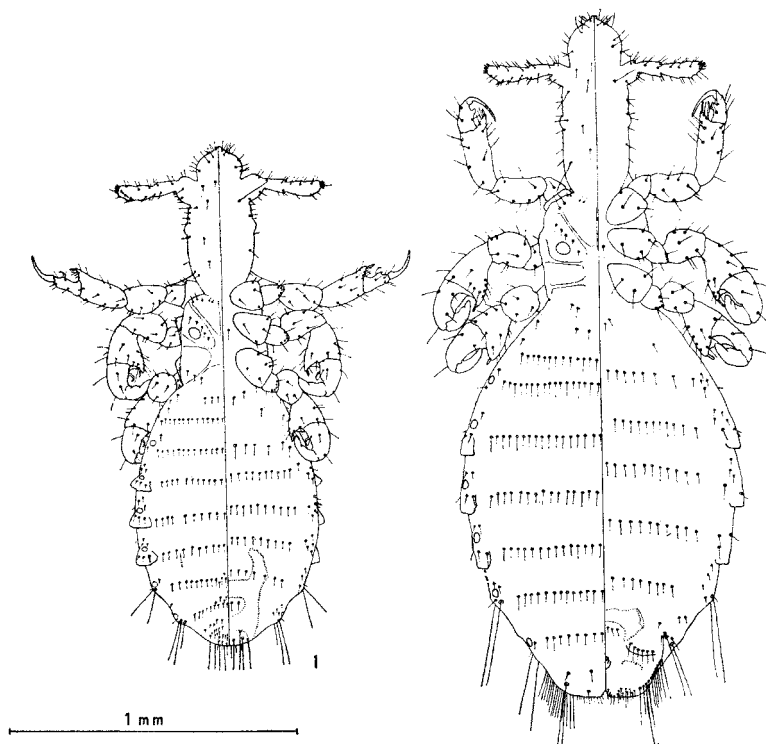
Lectotype: ♂ adult, collection of Dr. W. Reichmuth, Berlin, No. 3208.

Lectoparatypes: 2 adult males, 3 adult females, 4 larvæ.

According to Fahrenheit these lice have been found on a "*Cercopithecus patas*" by H. Friedenthal. Other data are not available.

Diagnosis: *Pedicinus* with three pairs of paratergal plates; second and third pairs of legs stouter and with heavier claws than the first pair; sclerotized rings of the three distal antennal segments well fused; with two long and one medium marginal setæ on each side of abdominal segment eight; in the male with 4 (or 5) setæ in the non-sclerotized island of the subgenital plate; penis apically very short and bilobate.

Figs. 1-2.



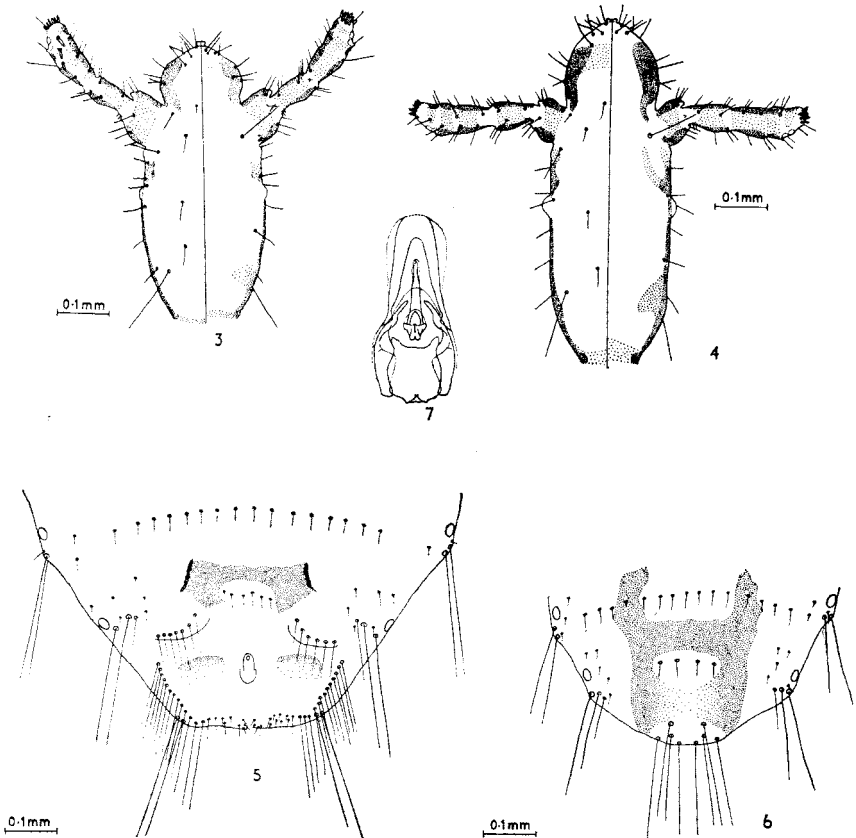
Pedicinus patas (Fahrenheit, 1916).

Dorsal view on the left, ventral view on the right side, the line is 1 mm. 1, Male; 2, female.

Description (figs. 1 and 2): Total length of the lectotype 1.70 mm.; total length of two male lectoparatypes 1.75 and 1.84 mm.; the three female lectoparatypes measure 2.14 mm., 2.33 mm. and 2.46 mm. These measurements have been taken after remounting, they are slightly greater than those given by Fahrenholz.

Head (figs. 3 and 4): According to Fahrenholz the head is inserted on the dorsal side of the thorax. To us the position of the "neck"-region seems to be the same as in any other species of *Pedicinus*, however, there is no pronounced constriction of the "neck"-region of the head. The length of the head is 0.50-0.52 mm. in the males, and 0.61-0.63 mm. in the females. This agrees with the head-lengths measured by

Figs. 3-7.



Pedicinus patas (Fahrenholz, 1916).

3-4, Head, dorsal (left) and ventral views (right), 3, male; 4, female; 5, posterior end of female, ventral view; 6, posterior end of male, ventral view; 7, male genitalia. The line is 0.1 mm.

Fahrenheit: ♂ 0.495–0.525 mm.; ♀ 0.615–0.630 mm. The head is very long, especially in the female, the sides are parallel in the postantennal part. The preantennal part of the head is very broad and blunt. The head of the male is slightly more rounded. The three distal antennal segments, especially 3 and 4, are coalescent. (Setæ on head and antennæ see figs. 3 and 4.)

Thorax: The pro- and mesothoracic coxal condyles are not united laterally. There is only one pair of setæ medially in the sternal area. The tibiotarsus of the fore leg is longer and slenderer than that of the middle and posterior legs, and it has a slender claw. The claws of the posterior pairs of legs are heavy and stout. (Setæ on thorax and legs, see figs. 1 and 2.)

Abdomen: There are three pairs of paratergal plates on segments 4 to 6, each plate bearing three setæ. Spiracles are present on segments 3 to 8. Besides some small ones there are two long marginal setæ on the seventh and two long and a medium one on the eighth segment.

♀: The subgenital plate of the eighth segment is comparatively short in the anterior-posterior direction, it is deeply emarginate posteriorly (fig. 5).

♂: From the material at hand we are unable to say if the subgenital plate is closed in the midline of the ninth segment ventrally or not, and therefore whether there is an unsclerotized island on the eighth segment or a "peninsula". In any case it bears two groups of two setæ each standing in a line (fig. 6). (In one male there are two and three setæ.) The short bilobate apex of the penis is very characteristic (fig. 7).

Other material seen: One male paratype of *Pedicinus bilobatus* Benoit, 1962, agrees perfectly with the type material of *Pedicinus patas*. It has five setæ in the unsclerotized "island" of the eighth abdominal segment. In size it is very close to the three male types of *P. patas*. In our opinion *P. bilobatus* is a synonym of *P. patas*. The type material of *P. bilobatus* apparently has been collected in the field from *Cercopithecus neglectus* Schlegel, 1876. This is interesting because we have some doubt if the material of Fahrenheit really had come from a *Erythrocebus patas* originally (see below).

Six males and three females from "Campbell's Monkey, London Zoological Garden, 1917", one male and five females "on Campbells Monkey, Wellcome Bureau, London 1907" and three males and six females from "*Cercopithecus*, Lukolela, Belgian Congo, August 1920, from Bequaert" all in the collection of Ferris, are not separable from *Pedicinus patas*. They are all very close to the type material of the species. There are usually four setæ ventrally in the "island" of the eighth segment, but they vary from 3 to 6. "Campbell's Monkey" is *Cercopithecus campbelli* which is found in the coastal forests from Ghana to the Senegal. At the locality Lukolela, Belgian Congo, the following species of *Cercopithecus* in a wider sense may be expected: *Cercopithecus neglectus*, *Cercopithecus pogonias grayi*, *Cercopithecus nictitans nictitans*,

Cercopithecus a. ascanius, *Cercopithecus cephus*, *Miopithecus talapoin talapoin* and *Allenopithecus nigroviridis*.

On a *Procolobus b. badius* from Peloken, Liberia (May 20, 1963) we have found one male and two females of this species besides many *Pedicinus badii* and *P. fastigatus*. This monkey had been transported by a hunter together with specimens of *Cercopithecus petaurista buettikoferi*, *C. campbelli campbelli* and *C. d. diana*. We have not found any lice on these guenons, but we have not been able to search their skins carefully. There seems to be no doubt, however, that these three *Pedicinus patas* had reached the Colobus-monkey after its death from one of the guenons. These lice are smaller than the other *Pedicinus patas* we have seen (see table), but otherwise they agree with them.

Ferris (1934) who had no access to the types of *Neopedicinus patas* identified some *Pedicinus* from "*Erythrocebus whitei*" and *Cercopithecus mitis kolbi* as *Pedicinus patas* "on the basis of hosts and the original description by Fahrenholz". His material from these monkeys, however, does not represent *P. patas*. Most probably Ferris himself has not been sure about this, because he is unusually vague about this species and has never mentioned the good material of the real *P. patas* in his collection. What Ferris unfortunately considered to be *P. patas* we are describing as a new species below.

Pedicinus ferrisi n. sp.

Holotype: ♂ adult, "Ferris col. 672, from *Lasiopyga albogularis kibonotensis*, Taveta, East Africa, USNM 18928 or 34682". Now in the collection of the University of California in Berkeley, Ca. The host is called *Cercopithecus mitis kibonotensis* Lönnberg, 1908 today.

Paratypes: One male and one female, same data as the holotype.

Two males (Berkeley) and one female (Washington): "Ferris col. 670, *Pedicinus patas* (Fahr.). From *Lasiopyga kolbi*, Lake Naivasha, Brit. East Africa, USNM 162844". The host is *Cercopithecus mitis kolbi* Neumann, 1902.

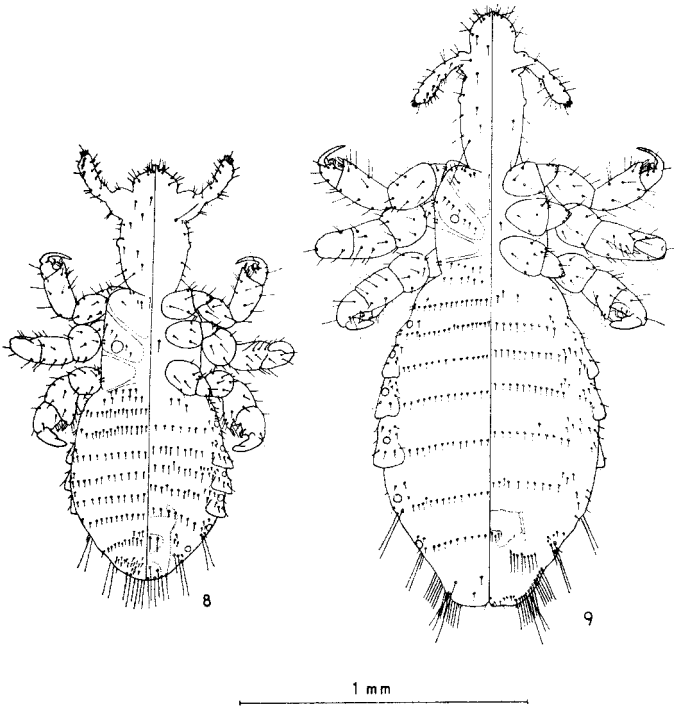
One female "Ferris col. 673, *Pedicinus patas* (Fahrenholz), from *Lasiopyga kolbi kolbi*, Mt. Kenia, Brit. East Africa, USNM 163939". The host is the same as above.

Two males and two females (British Museum) "*Pedicinus patas*, Hopkins Collection, *Cercopithecus mitis kandti* Matschie, Rutshuru, Congo Belge, May 1942, F. L. Hendricka".

Diagnosis: *Pedicinus* with three pairs of paratergal plates; second and third pairs of legs stouter and with heavier claws than the first pair; sclerotized rings of the three distal antennal segments well fused; with two long and one medium setæ on each side of abdominal segment eight; male with 4 (in one paratype 3) setæ in the non-sclerotized island of the subgenital plate; distal part of penis of medium length, the lateral margins converging acutely, the apex rounded.

Description (figs. 8 and 9): Total length of the holotype 1.43 mm; total length of five male paratypes 1.34 mm.–1.45 mm.; of five female paratypes 1.85 mm.–2.07 mm.

Figs. 8–9.



Pedicinus ferrisi n. sp.

Dorsal view on the left, ventral view on the right side, the line is 1 mm. 8, Male; 9, female.

In many essential characters as given in the diagnosis the new species is close to *Pedicinus patas*. The sexual dimorphism in the headlength however is not as marked in the types as in *P. patas* (see table). The lateral margin is more rounded in the postantennal part of the head, and the preantennal part of the head is smaller than in *P. patas* (figs. 10 and 11).

The subgenital plate of the female is much longer in the anterior-posterior direction than in *P. patas*, the posterior emargination does not penetrate to more than half of the length (fig. 12).

In the type material of the new species, too, we are not absolutely sure if the subgenital plate of the male is closed in the ninth segment (fig. 13). The penis differs very markedly from *P. patas* by its length (fig. 14). Two curved lobes overlapping the base of the penis from the sides are present in this species, but lacking in *P. patas*. On each side the

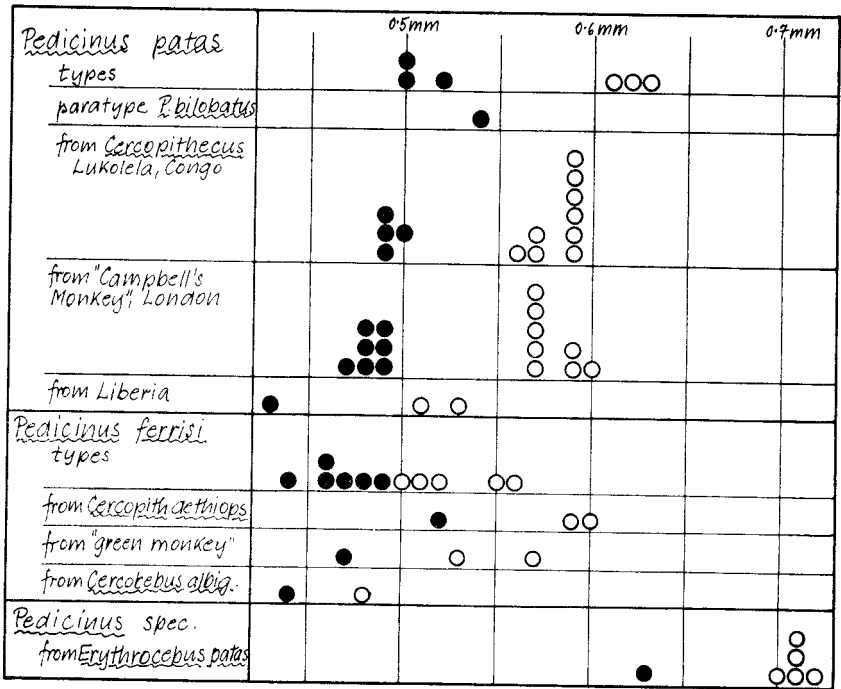


Table of Head Lengths. Black spots = ♂; circles = ♀.

lateral margin of the distal part of the penis carries a small tubercle. The apex of the penis is slightly swollen and rounded.

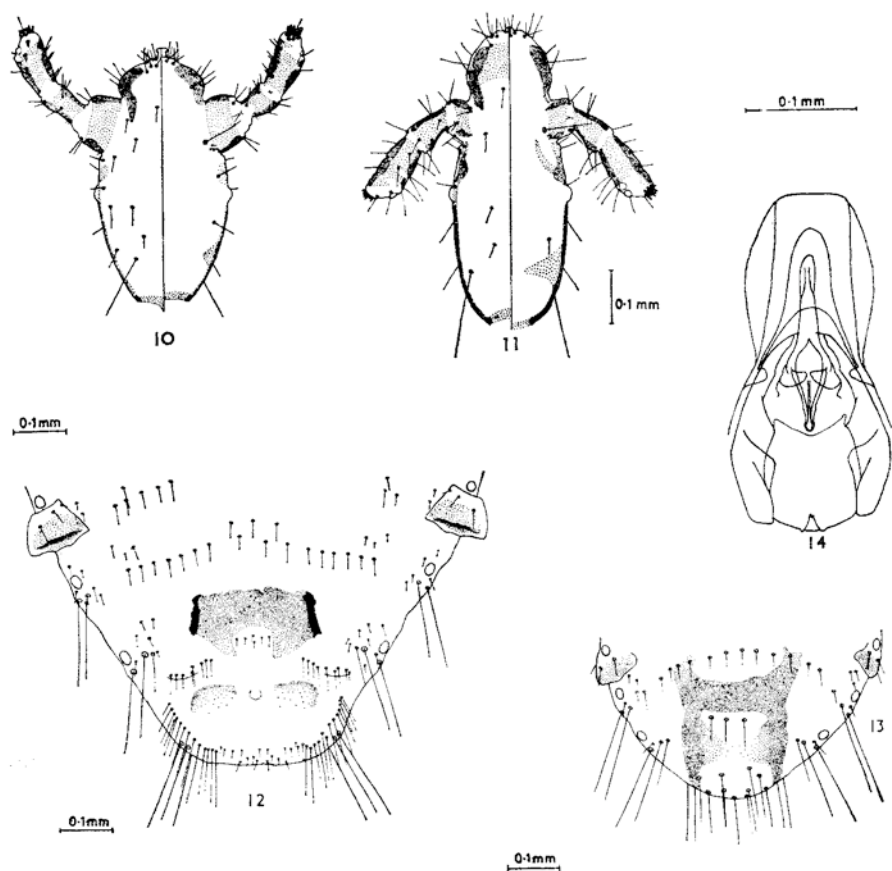
Other material seen: All the other *Pedicinus ferrisi* at our disposal are from doubtful hosts.

One male and two females from "*Cercopithecus aethiops*, Transvaal: Rietfontein, Polio Lab., Feb. 2, 1959" (Washington) have slightly longer heads than the types. The subgenital plate of the male is definitely closed in the ninth segment.

One male and two females from "Dead green monkey at Schmid's animal store; May, 29, 1936, Col. by H. E. Ewing" (Washington) are smaller. The subgenital plate of the male is closed, too. One male and one female from "*Cercocebus albigena johnstoni*, Semliki Forest, Bwamba, Toro, Uganda, A. J. Haddow" (British Museum) are not in very good condition. They seem to belong here. There is some doubt as to the host, as Hopkins (1949) writes: "*Cercocebus albigena*, . . . *Pedicinus* nov. near *patas*, one record . . . from a wild skin . . . Contamination was not wholly excluded". It may be safe to suppose that Hopkins referred to the material mentioned here.

Benoit (1959) and Cooreman (1952) have mentioned *Ped. patas*. We have not been able to see their material.

Figs. 10-14.



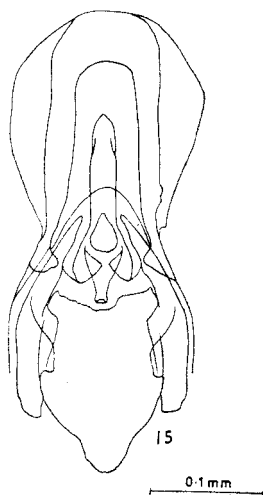
Pedicinus ferrisi n. sp.

10-11, Head, dorsal (left) and ventral (right) views, 10, male; 11, female; 12, posterior end of the female, ventral view; 13, posterior end of the male, ventral view; 14, male genitalia. The line is 0.1 mm.

Pedicinus spec.

Ferris's material of "*P. patas*" from *Erythrocebus whitei* (= *Erythrocebus patas pyrthonotus* Hemprich and Ehrenberg, 1832) is represented by one male (Washington) and five females (Berkeley). These specimens are certainly close to *P. ferrisi*, but they differ markedly in the form and size of the head (see table) and in the total length. The penis of the only male is broader, with a shorter apex and possibly a longer pseudopenis (fig. 15). The number of specimens however is too small to decide about the status

Fig. 15.



Pedicinus spec from *Erythrocebus patas*, male genitalia. The line is 0.1 mm.

of these lice. They suggest that the original host of *Pedicinus patas* (Fahrenholz, 1916) was not *Erythrocebus patas*, which is unfortunate because of the name.

In spite of the great difference in the shape of the male genitalia *Pedicinus patas* and *P. ferrisi* seem to represent one natural group, as they have some other characters in common. Undoubtedly they are most closely related to the species of lice living on the Colobinae. All these species of *Pedicinus* have three pairs of paratergal plates and stout second and third pairs of legs in common. The *Pedicinus pictus*-group (*pictus*, *polykomi*, *fastigatus*, *badii* and *veri*, see Kuhn and Ludwig 1963; 1964 a, b) and *P. ancoratus* have two long setae on the lateral margin of the eighth abdominal segment, the *P. patas*-group has two long ones and a medium one. The *pictus*-group has well separated sclerotized rings in the three distal antennal segments, while they are well fused in the others. The penis of *P. ancoratus* is clearly characterized by the acute lateral projections, the small tubercles found in *P. ferrisi* on the same place may be homologous to them. The penis in the *P. pictus*-group is short as in *P. patas*, but never bilobate.

SUMMARY.

The syntypes of *Neopedicinus patas* Fahrenholz, 1916, have been examined, a lectotype has been selected and the species is redescribed. Following Ferris (1934) *Neopedicinus* Fahrenholz, 1916, is not recognized as a genus distinct from *Pedicinus* Gervais, 1844. *Pedicinus bilobatus* Benoit, 1962, is a synonym of *P. patas*. What Ferris (1934, 1951) and

other authors considered to be *P. patas* is a distinct species which is here described and named *Pedicinus ferrisi* n.sp.

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