

# Myriapodologica

A SERIES OF OCCASIONAL PAPERS PUBLISHED AT RADFORD UNIVERSITY

ISSN 0163-5395

---

Vol 2, No. 2

June 1, 1986

---

*Identity of the Indian Cave Milliped Typhlopygmaeosoma hazeltonae Turk (Polydesmida, Opisotretidae?): Another case of Ordinal Misplacement in the Diplopoda.*

BY WILLIAM A. SHEAR

## ABSTRACT

An examination of the holotype of *Typhlopygmaeosoma hazeltonae* Turk, described from a cave near Simla, India, revealed that the species is not a member of the Order Chordeumatida, as stated by the describer. It is a member of the Order Polydesmida, most likely of the Family Opisotretidae, but the poor condition of the gonopods of the holotype precludes a definitive assignment.

Fifteen years ago, a compelling milliped mystery centered around the identity of *Ergethus perditus* Chamberlin, the only species of the Family Ergethidae. Chamberlin had described this species from Texas in 1949 and placed it in a new family in the Order Chordeumatida. It was unlike any other chordeumatid then known, having only 20 body segments and but one pair of legs modified as gonopods. The form of the gonopods was unique for a chordeumatid. In the interval from 1949 to 1970, the species and family were listed and discussed several times, but evidently the type had not been examined. I checked it as part of a revision of the North American chordeumatid fauna and found it to be a perfectly typical paradoxosomatid polydesmoid, belonging to a Peruvian genus that in the meantime had been named *Porcullosoma* by Otto Kraus (1956). *Ergethus* as a generic name had to replace *Porcullosoma*. Perhaps Peruvian material had become mixed with a Texas collection Chamberlin had been studying at the same time, though where the "17 ocelli" of the type came from is quite unclear as the animal is, like all polydesmoids, eyeless.

Having had this experience, similar suspicions were aroused in me when I saw the figures and read the description of the supposed chordeumatid cave milliped *Typhlopygmaeosoma hazeltonae* Turk, from northern India.

The chordeumatid millipeds of the Indian subcontinent are poorly known, and evidently few in number. Pocock (1903) described *Hendersonula collina* from the Palnai Hills near Madras from a single female. In 1941, Carl named a second species, *Pygmaeosoma palnense*, from practically the same place and set up the family Pygmaeosomatidae to contain it. Sundara Rajulu (1966 [1970]) described a series of specimens from the Alagarkoil forest in Madras as *Huttoniella cloudsleythompsoni*. *Huttoniella* is a synonym of *Schedotrigona*, a genus limited to New Zealand, Tasmania, and possibly South Australia (Mauries, 1978; in lett.). Nothing in Sundara Rajulu's description links his specimens to this genus. In fact, because only 18 trunk segments were present in "adults," all his material must have been immature, if indeed it even belonged to the Order Chordeumatida, a fact which his illustration of a midbody segment throws into extreme doubt. At this writing, my attempt to borrow the types of "*H.*" *cloudsleythompsoni* from the Zoological Survey of India has not been successful.

Hoffman (1980), who had examined the type of *Hendersonula collina* in the British Museum (Natural History), considered the generic name a senior subjective synonym of *Pygmaeosoma*, but, of course, the family name Pygmaeosomatidae stands. Since "*Huttoniella*" *cloudsleythompsoni* is, like the first two species, from Madras, it may also be a *Hendersonula* (assuming it is placed in the correct order!).

More recently, Mauries (1981) has described several species of a new genus *Lankasoma* (Lankasomatidae) from Sri Lanka. These species appear quite unrelated to *Hendersonula* and their position in the large system is problematical (Shear, in press). They are likely remotely related to *Schedotrigona* and to some Australian genera yet to be described (J.-P. Mauries, in lett.; S. Golovatch, in lett.).

Chordeumatid millipeds are quite common in the Nepalese Himalayas, where three families, several genera, and numerous species have been collected (Shear, 1979, in press). All of these forms belong in Holarctic families (Cleidogonidae, Kashmiriematidae, and Megalotylidae) and have affinities to the north, though kashmiriematids have evidently spread into Southeast Asia. Pygmaeosomatidae and Lankasomatidae remain the only truly indigenous south Indian chordeumatid families, and as discussed above, their relationships remain unestablished. However, present biogeographical theory would imply that they should find a position among the Gondwanan fauna of chordeumatids that is now being worked out, and includes elements in Chile, New Zealand, Australia, New Guinea, and Indonesia.

The first description of a chordeumatid from the Himalaya foothills (from the cave of Song Gahar, near Simla, about 300 km north of Delhi), was that of *Typhlopygmaeosoma hazeltonae*, by Turk (1972). Turk put his new species and genus in the Pygmaeosomatidae. As I have already stated, my first impression upon seeing this description was that the animal had been misplaced. The segment structure, gnathochilarium, and gonopods, as illustrated by Turk, were all those of a member of the Order Polydesmida.

Through the courtesy of Paul Hillyard, Department of Zoology, British Museum (Natural History), I was able to borrow the type specimen of *T. hazeltonae*. My examination of the body of the holotype (preserved in alcohol) confirmed that it

was indeed polydesmoid. The head and gnathochilarium are typical of that order, and further, the trunk segments are fused in complete rings—as in the Polydesmida—and do not have separate sterna. The metazonites bear three rows of setal sockets—as in many Polydesmida—and not the characteristic 6 macrosetae of the Chordeumatida. Ozopores, which never occur in chordeumatids, are present on some of the segments; exactly which ones cannot be clearly determined because the body is in pieces and some segments are missing. Aside from these points, the drawings presented by Turk (1972) of the head, segments and posterior end of the animal are crude but reasonably accurate (the long setae shown at the posterior corners of each metazonite were absent in the type; Turk probably mistook the ozopores for setal sockets and “restored” the setae in his drawing), though the labelling and interpretation are obviously mistaken. Likewise the measurements are correct as given, within an acceptable limit of error.

Unfortunately, the gonopods had been dissected from the animal and mounted on a slide in some kind of water soluble medium, which had then been sealed with varnish or a similar substance. The varnish had cracked and the mounting medium had completely dried up, resulting in very substantial distortion of the gonopods. After cleaning, dehydrating and remounting the gonopods in Kleermount, I made a drawing of them (fig. 1) using a camera lucida apparatus. I was able to discern both a seminal groove and a coxal solenite, neither of which are features of chordeumatid gonopods. Turk (1972) evidently had broken the single pair of gonopods into two pieces and illustrated the coxae and solenites as the “anterior gonopods,” and the telopodite as the “posterior gonopod.” In their present state the gonopods of the holotype bear little resemblance to the illustrations of Turk, which, because of the indication of several articulations in the telopodite, would appear to be highly inaccurate in any case. In Turk's fig. 6, “anterior gonopods,” reproduced here as fig. 2, the coxal solenites (cs) and their sockets are clearly shown, but labelled by Turk as telopodites. I interpret the long filamentous structure as possibly part of the prefemur and a prefemoral process. There is no evidence from the actual gonopods that the coxae are fused to one another as shown. In Turk's fig. 7, “posterior gonopods,” the basal setose part is labelled by Turk as the sternum, but may be part of the coxa or part of the prefemur. The prefemur (or femur) bears a long process, and the acropodite is shown as having a clear division between the femoral (?) part and the tibiotarsus. Although shown by Turk as articulations, none of these clear divisions could be identified on the slide-mounted gonopods, which evidently are lacking several structures seen by Turk. The gonopods illustrated by Turk may have come from two animals or may have been partly “restored” by him in the drawing process.

Interpretation of the gonopods based on their distorted remains and on the drawings by Turk is difficult. If the setose basal part in fig. 3 is interpreted as prefemoral, then the long process extending from the femoral region could be interpreted as the solenomerite of a paradoxosomatid, an interpretation consistent also with the evident subdivision of the telopodite. I can present no ideas about generic position if this is so. However, a strong argument against placing *T. hazeltonae* in the Paradoxosomatidae lies in the fact that the upper marginal setae of the paraprocts are located on the margin. In all paradoxosomatids these

setae are some distance anterior of the margin of the paraproct, a character not known to occur in any other family of Polydesmida.

If the same section is part of the coxa, then the long process comes from the base of the prefemur. This presents a definite similarity to the newly established family Opisotretidae (Hoffman, 1980), endemic to the East Indies, and the shape of the acropodite suggests that occurring in the genus *Carlotretus* Hoffman (Hoffman, 1980; see fig. 247 in Attems, 1940).

Yet a third alternative was brought to my attention by R. L. Hoffman. Turk's drawing of the gonopod is quite similar in many respects to that of *Ophiodesmus albonanus* (Latzel) presented by Schubart (1934). The seminiferous branch of this species evidently comes off the prefemoral region, and the branching pattern of the tibiotarsus is quite similar to that of *T. hazeltonae* as illustrated by Turk. Hoffman (1980) places *O. albonanus* in the family Macrosterodesmidae. The species is known from western and central Europe, but seems to be a synanthrope (Schubart, 1934) whose place of origin is unclear, it could be native to Europe.

Both of the latter two alternatives are complicated by the fact that I could not verify the presence of the long basal branch of the gonopod on the distorted slide preparation made from the holotype. However, of the three choices presented here, zoogeographical evidence inclines me toward inclusion of the species in Opisotretidae. Obviously, toptotypical material will be required to resolve the matter once and for all.

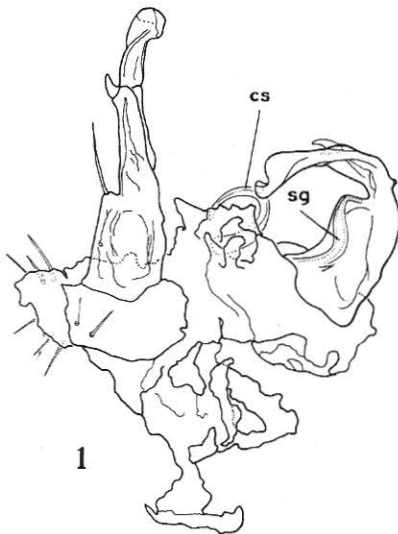


Fig. 1. The gonopods of the male holotype of *Typhlopygmaeosoma hazeltonae* Turk, drawn with a camera lucida. 200 x. Note seminal groove (sg) and coxal solenite (cs).

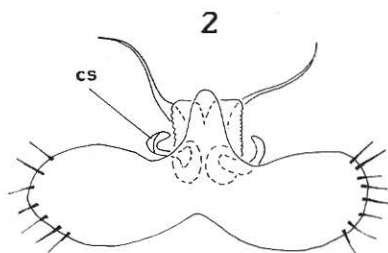


Fig. 2. Traced from an enlarged xerox copy of Turk's fig. 6, titled "anterior gonopods," but here interpreted as the gonopod coxae; cs, coxal solenite.



Fig. 3. Traced from an enlarged xerox copy of Turk's Fig. 7, titled "posterior gonopods," but here interpreted as part of the coxa and entire telopodite of the (probably right) gonopod.

## LITERATURE CITED

- Attems, C. 1940. Polydesmoidea III. *Das Tierreich*, vol. 70. Walter de Gruyter and Co., Berlin. 577 pp.
- Carl J. 1941. Diplopoden aus Südindien und Ceylon. 2. Teil: Nematophora und Juliformia. *Rev. Suisse Zool.* 48:569-714.
- Chamberlin, R. V. 1949. A new family in the diplopod order Chordeumida. *Proc. Biol. Soc. Washington* 62:7-8.
- Hoffman, R. 1980. Classification of the Diplopoda. *Mus. d'Hist. Nat., Genève.* 237 pp.
- Kraus, O. 1956. Über neotropische Strongylosomatidae (Diplopoda). *Senckenberg. biol.* 37:403-419.
- Mauriès, J.-P. 1978. Le genre neo-zelandais *Schedotrigona* Silvestri, 1903: revision et place dans une nouvelle classification des Craspedosomides (Myriapoda, Diplopoda, Craspedosomida). *Bull. Mus. nat. Hist. nat.*, 3 ser., no. 510:43-66.
- 1981. Craspedosomida, Stemmiulida et Cambalida (Myriapoda: Diplopoda) de Sri Lanka (Ceylan). *Ent. scand., Suppi.* 11:33-62.
- Pocock, R. I. 1903. Remarks upon the morphology and systematics of certain chilognathous diplopods. *Ann. Mag. Nat. Hist.* 7:515-532.
- Schubart, O. 1934. Tausendfüßler oder Myriapoda. I. Diplopoda. 28. Teil in *Die Tierwelt Deutschlands*. Gustav Fischer, Jena. 318 pp.
- Shear, W. A. 1971. The identity of *Ergethus perditus* Chamberlin (Diplopoda, Polydesmida, Paradoxosomatidae). *Proc. Biol. Soc. Washington* 83:455-458.
- 1979. Diplopoda from the Nepal Himalayas. Chordeumida with comments on the Asian chordeumid fauna. *Senckenberg. biol.* 60:115-130.
- In press. Chordeumatid Diplopoda from the Nepal Himalayas. II. *Senckenberg. biol.*
- Sundara-Rajulu, G. S. 1966 (1970). On *Huttoniella cloudsleythompsoni* n. sp. from South India. *Rec. Zool. Surv. India* 64:97-100.
- Turk, F. A. 1972. A new blind millipede (*Typhlopygmaeosoma hazeltonae*, n. gen., n. sp.) from a Himalayan cave with notes on its zoogeographical significance. *Trans. Cave Res. Group Gr. Brit.* 14:195-198.

Address of the author:

Dr. William A. Shear  
Department of Biology  
Hampden-Sydney College  
Hampden-Sydney, Virginia 23943