ON THE TAXONOMIC STATUS OF PLATYPODIDAE AND SCOLYTIDAE (COLEOPTERA)

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Abstract.— The reduction of Platypodidae and Scolytidae to subfamilies of Curculionidae by certain recent authors is questioned. Several fundamentally important anatomical characters that could not possibly have been derived from Curculionidae are cited. Platypodidae (including Coptonotidae) is recognized provisionally as a derivative of Scolytidae; Scolytidae, with subfamilies Hylesininae and Scolytinae (including Ipinae), is also recognized as a family. *Protoplatypus*, new genus, for *P. vetulus*, n. sp., a primitive platypodid from New Guinea, and *Protohylastes*, new genus, for *Pr. annosus*, n. sp., a primitive scolytid from Queensland, are described.

Apparently commencing in 1954 with Crowson (1967:155), a number of coleopterists have reduced the traditionally recognized families Scolytidae and Platypodidae to the rank of subfamily within the Curculionidae without establishing a foundation for this action. The recent generic classification of the Platypodidae (Schedl, 1972) neglected either to acknowledge or to respond to this change.

In reviewing more than a dozen classifications of higher categories within the Curculionoidea, the most striking feature noted in them is the lack of agreement on even the most fundamental divisions of the group, apparently due to a lack of detailed knowledge on the morphology of this enormous superfamily. It would appear that only Crowson's (1967) major division, based on separate or confluent gular sutures, is the only phylogenetically sound division of the group that has been presented. His classification of families in the first division (couplets 1 to 5) is reasonable (although the Oxycorynidae and Proterhinidae are unknown to me). His classification of the second division, groups having only one median gular suture (couplets 6 to 8), is questioned. The basis for this question is an unpublished and incomplete comparative anatomical study of the Curculionoidea that was started many years ago but interrupted due to the lack of specimens for dissection in critical groups. The following comments relating to the pregula and pregular sutures were drawn from that study.

In the superfamily Curculionoidea five families (Crowson, 1967) have at least the posterior indications of widely separated gular sutures. In the Belidae these sutures continue separately to near the ventral apex of the rostrum, where they diverge and direct their course to or at least toward the anterior tentorial pits above the anterior articulation of the mandible as in other insects. In the Anthribidae these sutures are obsolete except for minute irregularities on the margin of the occipital foramen; in Nemonychidae and apparently in Oxycorynidae (not seen) and Proterhinidae (not seen), separate sutures (Crowson, 1967: Figures 201-202) extend anteriorly

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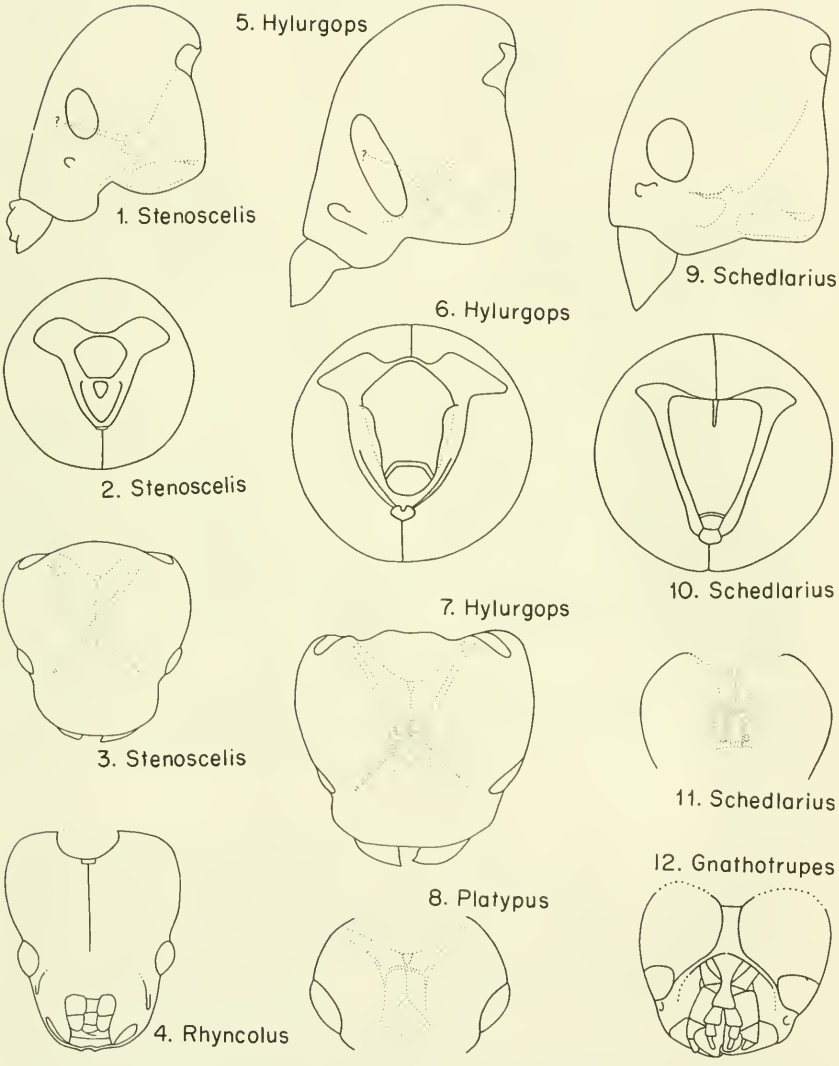
to the posterior tentorial pits. In all other Curculionoidea the gular sutures are confluent, with only one median suture (usually) visible from near the occipital foramen to the single, median, posterior tentorial pit at the ventral base of the rostrum. Apparently all workers have overlooked the minute postgula on the margin of the occipital foramen at the base of the gular suture (Figures 1-19). Some workers, realizing that a pregula should be present (c.f. Hopkins, 1909:16, and Stickney, 1923), either created pregular sutures for their illustrations of curculionids or misinterpreted longitudinal ridges on the rostrum as being pregular sutures. In a survey of several hundred genera of Attelabidae, Brenthidae, Apionidae, and Curculionidae (s. str.) I was unable to find any representative having pregular sutures accompanied by internal ridges that resulted from the inflection of the cuticle to form those sutures. However, pregular sutures are conspicuously present in all Platypodidae and in all Scolytidae except a few Micracini, etc., that bore into exceedingly hard wood (in which case the gular suture is also obliterated).

It apparently has been traditional among those coleopterists who have considered the matter (Crowson, 1967:155; Schedl, 1972) to presume that the Scolytidae were derived from the tribe Rhyncolini of the subfamily Cossoninae and that the rostrum of the ancestral form was lost when scolytid habits were established. Yet in no truly primitive platypodid or scolytid is there a rostrum resembling that of Cossoninae. Furthermore, no representative of the Rhyncolini or of any other cossonid known to me (including an apparently unnamed Australian cossonid genus with absolutely no rostrum whatever and large mandibles) has pregular sutures (Figure 4). In this latter character I have found no intergradation, either externally or in the much more complex internal structure. The recognition of this fact suggests that other indicators of phyletic relationship be examined.

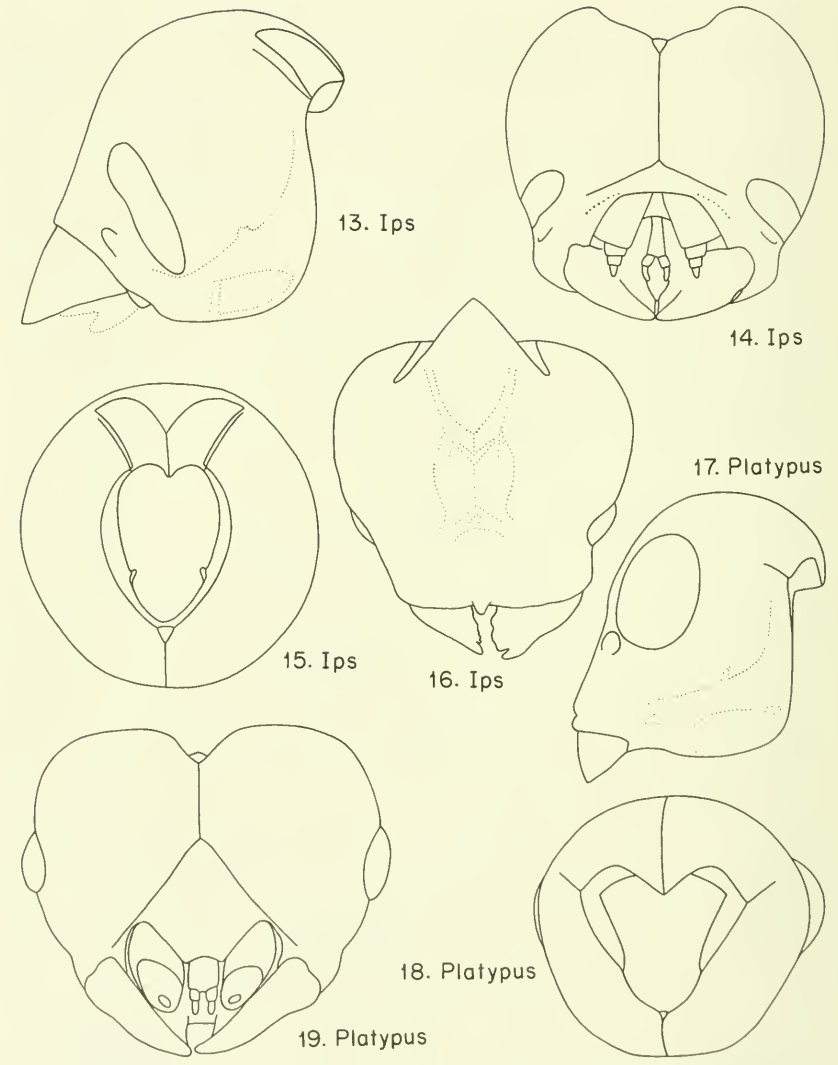
Primitive Platypodidae, primitive representatives of all primitive tribes of Scolytidae, and many Cossonini have interstriae 10 on the elytra broad throughout its length to near the elytral apex. In all Rhyncolini known to me the portion of interstriae 10 posterior to the level of the hind coxa is strongly constricted or entirely obsolete. Therefore, based on this character in living material examined, there is no possibility that the Rhyncolini could have given rise to either the Platypodidae or Scolytidae.

Crowson (1967:158) indicated that all adult Curculionoidea having one gular suture, except Attelabidae, have the adult maxillary palpus 2- or 3-segmented. Browne (1971:49) reported a 4-segmented maxillary palpus in *Austroplatypus* Browne, a platypodid. It is very doubtful that this genus was derived from an ancestral form having a 3-segmented maxillary palpus.

In all Rhyncolini and most (all?) Cossoninae known to me there is a conspicuous spine on the margin of the oral fossa that arises between the posterior margin of the mandible and the base of the maxilla (Figure 4). There is no comparable structure or irregularity in this area in Platypodidae or Scolytidae (Figures 12, 14, 19).



Figs. 1-12. Head capsules of beetles with the tentorial appartus indicated by dotted lines: 1-3, *Stenoscelis brevis* (Boh.), Cossoninae, 1 lateral, 2 posterior, and 3 dorsal aspects; 4, *Rhyncolus knowltoni* (Thatcher), Cossoninae, ventral aspect; 5-7, *Hylurgops rugipennis* (Mannerheim), Hylesininae, 5 lateral, 6 posterior, and 7 dorsal aspects; 8, *Platypus lucasi* Chapuis, Platypodinae, dorsal aspect; 9-11, *Schedlarius mexicanus* (Dugès), Coptonotinae, 9 lateral, 10 posterior, and 11 dorsal aspects; 12, *Gnathotrupes* sp., *Scolytinae*, ventral aspect.



Figs. 13-19. Head capsules of beetles with the tentorial appartus indicated by dotted lines: 13-16, *Ips mexicanus* (Hopkins), Scolytinae. 13 lateral, 14 ventral, 15 posterior, and 16 dorsal aspects; 17-19, *Platypus lucasi* Chapuis, Platypodinae. 17 lateral, 18 posterior, and 19 ventral aspects.

Kuschel (1966:6) suggested that a series of spines on the lateral margins of the tibiae in Scolytidae and in the Araucariini (Cossoninae) indicate a relationship between these groups. Evidently it was not recognized that the most primitive genera of Scolytidae lack these spines and have tibiae more nearly like the Cossonini or even like certain Brenthidae. The supernumerary tibial spines in these

groups apparently were acquired independently as they adapted to a common niche and, therefore, are not primitive. Kuschel also called attention to the similarity in habits of the Araucariini and Scolytidae. In the two species of Araucariini (presumably *Coptococynus* spp.) examined in the field, the habits do not resemble in any way those of more than 2000 species (about 30 percent of the known fauna) of Scolytidae I have studied in the field. The habits of certain neotropical Rhyncolini (unidentified) are infinitely more similar to primitive scolytids.

Larval characters that separate the Scolytidae from Curculionidae have not been reported, presumably due to inadequate research rather than to the absence of characters. Most larval Platypodidae have the clypeus reduced or absent and the labrum somewhat enlarged. The cercus-like processes in *Trachyostus* (Browne, 1967: Figure 20) and the tenth abdominal segment of *Dolgopygus* (Browne, 1967: Figure 23) require investigation.

It is my contention that the Scolytidae and Platypodidae represent a phyletic line that diverged from other Curculionoidea before pregular sutures were lost and before a rostrum developed. The Cossoninae (Figures 1-4) are true curculionids in the structure of the gular area, tentorial apparatus, head, legs, and body form, and probably resemble scolytids largely because they independently occupied the same or a similar niche. While the scolytids and platypodids clearly fall within the Curculionoidea, it is as logical to recognize them as an independent group as it is any other family within this superfamily. There is great difficulty, however, in separating the Scolytidae from the Platypodidae, and I find it difficult to give independent family status to the latter group.

In order to emphasize the significance of the above items, it is necessary to describe the most primitive platypodid and the most primitive hylesinine scolytid known to me.

Protoplatypus, n. gen.

The phloeophagous habit and normal tarsi of this remarkably primitive genus suggest that it should be placed in the family Scolytidae; however, the head, tibiae, pronotum, and other characters indicate a closer relationship to primitive Platypodidae. Although not closely related to either genus, its phylogenetic position probably lies between *Mecopelmus* Blackman (Platypodidae) and *Craniodycticus* Blandford (Scolytidae). For convenience of reference I tentatively place it in the Mecopelmini (Platypodidae).

Characters of particular significance in phylogeny found in this genus include the cylindrical, 3-segmented maxillary palpus, an antenna intermediate between that of *Platytarsulus* (Platypodidae) and *Craniodycticus* (Scolytidae), a protibia intermediate between that of *Schedlarius* (Platypodidae) and *Protohylastes* (Scolytidae), an eye similar to that of platypodids, and tarsi similar to those of scolytids. The phloeophagous and polygamous habits are, for the most part, typical of scolytids.

Description.— Head about as in *Schedlarius* Wood; eyes subcircular, moderately convex; pregula rather large, as in most Platypodidae; antennal scape long, slender, funicle 5-segmented, club rather small, somewhat flattened, entirely devoid of sutures, glabrous except for a marginal fringe of abundant, short hair (much as in *Platytarsulus* Schedl but much more restricted to actual margin). Pronotum elongate, sides constricted as in most Platypodidae; precoxal area of prosternum elongate, almost half as long as entire prosternum, precoxae small, very widely separated. Scutellum subacutely pointed behind. Elytral bases rounded, not precipitous, striate, interstriae 10 attaining declivital area; posterior area declivous, sculpture simple. Protibiae of platypodid type; tarsi with segment 1 only slightly longer than 2 or 3, very slightly shorter than 5, entire tarsus slightly longer than tibia, all segments cylindrical.

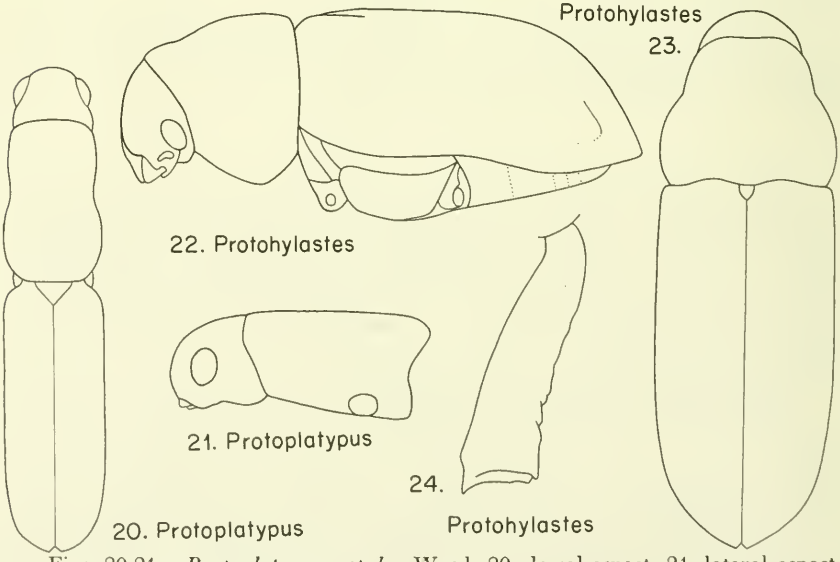
Type species.— *Protoplatypus vetulus* Wood, described below.

Protoplatypus vetulus, n. sp.
Figures 20, 21, 26

This species is distinguished from other known forms by characters summarized in the above description of the genus. It could be placed in either the Platypodidae or Scolytidae, depending upon which characters are emphasized.

Male.— Length 1.2 mm (paratypes 1.2-1.5 mm), 4.0 times as long as wide; color light brown.

Frons strongly, rather evenly arched from epistoma to vertex,



Figs. 20-21. *Protoplatypus vetulus* Wood: 20, dorsal aspect; 21, lateral aspect of head and prothorax, leg omitted. Figs. 22-24, *Protohylastes annosus* Wood: 22, lateral aspect; 23, dorsal aspect; 24, anterior aspect of left metathoracic tibia.

rather broadly convex, somewhat intermediate between *Schedlarius* and *Coptonotus* Chapuis; surface reticulate, with sparse, fine, shallow punctures; vestiture very sparse, hairlike; eye broadly oval to subcircular, moderately convex; pregula rather large, as in Platypodidae; maxillary palpi cylindrical, 3-segmented.

Pronotum 1.5 times as long as wide; widest on basal third, sides conspicuously constricted just in front of middle, anterior margin only slightly narrower than base; surface shining, reticulate at base and sides, longitudinally, subreticulately strigose on discal area, punctures minute, shallow, moderately close. Glabrous.

Elytra 2.3 times as long as wide, 1.6 times as long as pronotum; sides straight and parallel on basal three-fourths, broadly rounded behind; scutellum acute; elytral bases rather weakly, not precipitously, elevated; entire surface strongly reticulate; striae not impressed, punctures small, moderately deep, spaced within row by about two diameters of a puncture; interstriae twice as wide as striae, punctures very small, widely, regularly spaced. Declivity confined to posterior fourth, broadly convex; striae about as on disc; interstriae 1 and posterior half of 9 moderately, continuously elevated and meet at sutural apex, 3 less strongly elevated and ending before attaining 9. Vestiture of sparse, very minute, almost scalelike setae.

Female.— Similar to male except frons with a triangular area on lower two-thirds smooth, shining, its upper margins marked by an irregular row of small punctures; scape with setae near apex distinctly longer.

Type Locality.— Five miles or 8 km NW Bulolo, Morobe, New Guinea.

Type Material.— The male holotype, female allotype, and 96 paratypes were collected at the type locality in the LATEP logging area, on 9-VIII-72 from the bole of a recently cut *Harpullia pedicellaris*, by S. L. Wood. The parental galleries were in the cambium region but did not engrave the wood; they were of the radiate type, and the beetles appeared to be polygamous. Larval mines were parallel to the grain of wood and were visible on the inner surface of peeled bark.

The holotype, allotype, and several paratypes are in the Australian National Collection at Canberra; the other paratypes are in the British Museum (Natural History) and in my collection.

Protohylastes, n. gen.

This genus superficially resembles *Hylurgops* LeConte or *Pseudohylesinus* Swaine, except that the tibiae are completely different from any other genus of Hylesininae and the protibiae are more nearly like a curculionid (Curculionoinae) than a scolytid. The bases of the elytra are similar to those of *Hylurgops*, without a definite marginal row of crenulations, except that the submarginal crenulations are even more poorly developed.

Diagnosis and Description.— Head much as in *Pseudohylesinus;* eye oval, short; antennal scape short, funicle 7-segmented, shorter than scape, club as long as scape, small, subconical but distinctly flattened, entirely devoid of sutures. Prothorax about as in *Pseudohylesinus* except coxae rather widely separated, an acutely elevated ridge extending from anterolateral margin of coxa to anterolateral margin of prothorax (as in *Hylurgops*). Elytra much as in *Hylurgops* except basal margins not armed and interstriae 10 extends to declivity. Anterior tibia slender, entirely unarmed on margins, a terminal spine next to tarsal insertion at center of apex, a very small spine on lateral and median apical angles; meso- and metathoracic tibiae similar except obliquely truncate at apex, with a very short, blunt spine on both inner and outer angles (Figure 24). Tarsal segments 1 and 5 each about as long as 2 and 3 combined, 3 broadly bilobed.

Type-species.— *Protohylastes annosus* Wood, described below.

Protohylastes annosus, n. sp.
Figures 22-25

This species resembles a very large *Pseudohylesinus*, but it is distinguished from all previously known Scolytidae by the very different tibiae.

Adult.— Sex not determined. Length 9.8 mm. 2.6 times as long as wide, color very dark brown, vestiture pale.

Frons convex, epistomal area transversely impressed, a small, median impression at upper level of eyes; surface smooth, shining, punctures moderately coarse, close, their interiors apparently reticulate; subglabrous, a few scales on lateral margins, a few hairlike setae in epistomal area. Eye oval, about 1.5 times as long as wide. Antenna as described above.

Pronotum 0.80 times as long as wide; widest at base, sides arcuately converging to a rather strong constriction just behind very broadly rounded anterior margin; basal margin bisinuate; surface smooth and shining on most of discal area, becoming reticulate in all marginal areas and on sides; punctures moderately coarse, close, deep, weakly subcrenulate at base and in lateral areas. Vestiture of rather sparse scales, each scale about six times as long as wide.

Elytra 1.7 times as long as wide, 2.3 times as long as pronotum; sides almost straight and parallel on basal two-thirds, rather narrowly rounded behind; striae weakly impressed, punctures small, close, deep; interstriae twice as wide as striae, surface finely rugose-subreticulate, with numerous small, confused, transverse crenulations, each up to one-third width of an interstriae; crenulations near basal margins much as in *Hylurgops*, but margin without a definite row of crenulations. Declivity moderately steep, occupying posterior third of elytra, broadly convex, with areas at apices of interstriae 5-7 slightly elevated; striae more deeply impressed; interstriae 10 reaching declivity. Vestiture of rather abundant, small scales.

each scale very slightly longer than wide, their color pale except small patches of dark brown on declivity.

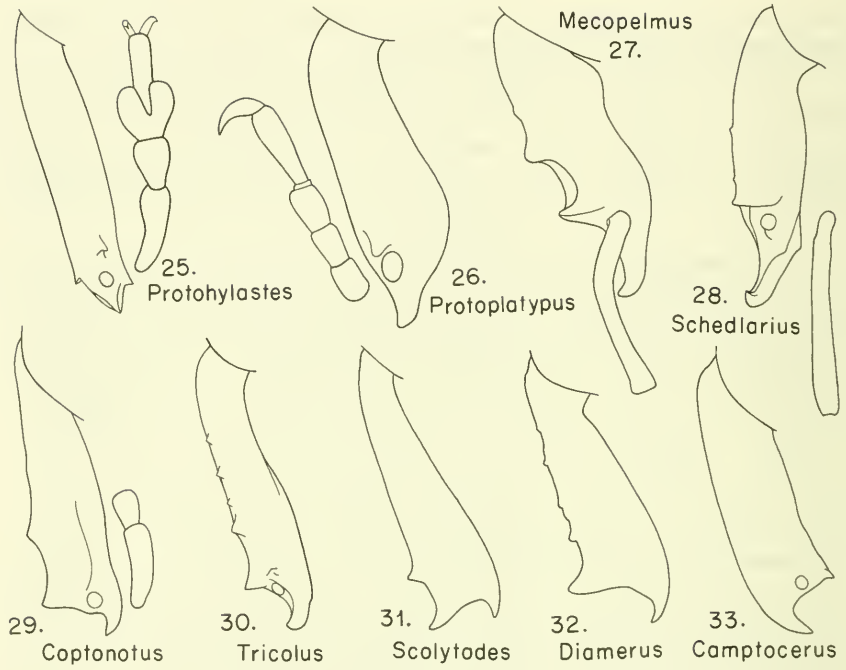
TYPE LOCALITY.— Eungella National Park, Queensland, Australia.

TYPE MATERIAL.— The unique holotype was taken at the type locality on 10-XII-65, by G. Monteith. It is in the Queensland Museum.

Platypodidae

Most platypodids belong to a compact subfamily of highly modified ambrosia beetles. In fundamental structure they differ from scolytids only in degree, not in the kind of characters represented. They share with primitive scolytids the same basic head structure, including a large, well-defined pregula (Figures 8, 17-19). The mouthparts in most of them are highly modified to the ambrosial habit, but primitive forms (Coptonotinae) are comparable to those of scolytids. Virtually identical antennae and pronota are found among primitive forms in the two groups. The protibiae at first appear unique until it is noted that tubercles and ridges appear on the posterior face of the protibiae of some representatives of almost all groups of scolytid woodboring ambrosia beetles. If the minute ridges and tubercles on the posterior face are ignored and the spines and denticles on the apical and lateral margins are emphasized, or if only bark-infesting genera are examined, a graded series of steps apparently bridging the gap between primitive scolytids and primitive platypodids can be demonstrated (Figures 25-33). Since socketed tibial spines characteristic of most scolytids occur only in that group and not in platypodids, only unsocketed spines are considered primitive here.

When the posterior face of the prothoracic tibiae are viewed from exactly the same aspect it is noted that the tarsal insertion is visible near the apex on all Platypodidae, including Coptonotinae, on *Protohylastes*, and on all Scolytini. In *Protoplatypus*, *Mecopelmus*, and *Protohylastes* the tarsus evidently is capable of movement through an arc of almost 180 degrees from the lateral to posterior to mesal positions. In *Coptonotus* and most Scolytini the action is similar but the arc is somewhat smaller. In some Scolytini the tarsal insertion is closer to or even on the apical margin, and greater freedom of movement may occur. In *Schedlarius* the lateral margin of the tarsal insertion is slightly elevated, thus restricting tarsal action more nearly to the posterior to mesal arc; in Platypodinae this arc evidently is even more strongly restricted. In *Aricerus*, *Scolytoplatypus*, and many of the higher Scolytinae, the tarsal insertion is on the apical or lateral margin, and tarsal action apparently is through an arc from the lateral to anterior and possibly posterior positions. In most Hylesininae the tarsal insertion is clearly on the anterior face, and tarsal action is restricted to an arc from the lateral to anterior position or less. A submarginal tubercle on the posterior face near the tarsal insertion in primitive forms appears to have special significance; it is absent in Scolytini and Cossoninae.



Figs. 25-33. Posterior face of prothoracic tibiae: 25, *Protohylastes annosus* Wood, with tarsus, Hylastini; 26, *Protoplatypus vetulus* Wood, with tarsus, Coptonotinae; 27, *Mecopelmus zeteki* Blackman, with first segment of tarsus, Coptonotinae; 28, *Schedlarius mexicanus* Dugès, with first segment of tarsus, Coptonotinae; 29, *Coptonotus cyclops* Chapuis, with first and second tarsal segments, Coptonotinae; 30, *Tricolus peltatus* Wood, Scolytinae; 31, *Scolytodes* sp., Scolytinae; 32, *Diamerus impar* Chapuis, Hylesininae; 33, *Camptocerus auricomus* Blandford, Scolytinae. All drawings were made at different scales so as to be reproduced at a uniform size.

In platypodids the first tarsal segment is supposed to be as long as the remaining segments combined; in some it is actually less than half as long (Schedl, 1939). Representatives of the Coptonotinae (Coptonotidae of Schedl) have the tibiae and tarsi as in some Platypodinae (Platypodidae of Schedl) except that there is greater variability, particularly in the length of the first tarsal segment. One of these, *Schedlarius*, has wood-boring habits, but the larvae, unlike Platypodinae, form independent mines that wander through deep xylem tissues; fungal activity definitely associated with the beetles alters the character of the wood, although there is no mycelial growth in the tunnels that could be used for food as occurs with ambrosia beetles. Another coptonotid, *Mecopelmus* Blackman, is phloeophagous; a large nuptial chamber is formed by the parents in which clusters of eggs are deposited, and larvae then form individual mines that wander in a radiating pattern from this chamber. The genus *Protoplatypus* described above is anatomically rather closely allied

to *Mecopelmus* except that the tarsi are typical of scolytids; as noted above, it is phloeophagous and polygamous.

In most male platypodids, abdominal tergum 8 is of reduced size and is largely or entirely covered by tergum 7 as in the female. In *Schedlarius*, male tergum 8 is more nearly intermediate between the reduced state seen in other platypodids and the normal condition of most scolytids and many curculionids. A reduced male tergum 8 also occurs in the scolytid tribes Ipini (*Ips*, etc.) and Carphodycticini (*Craniodycticus*, etc.). It is doubtful that this reduction in these two tribes indicates a close relationship to platypodids.

The larvae of platypodids and scolytids are inadequately known, but most of them can be segregated using features of the labrum and clypeus. In platypodids the clypeus is broad and strikingly reduced in length or entirely absent and the labrum is proportionately lengthened. In *Schedlarius* and *Protoplatypus* of the Platypodidae and *Carphodycticus* Wood in Scolytidae, the labrum and clypeus are intermediate in size and shape.

In my opinion the platypodids are an aberrant group of ambrosia beetles, as are most other groups of ambrosia beetles within the family Scolytidae, that arose long after scolytid-platypodid characters had been well established. The ambrosial habit has arisen repeatedly within the Scolytidae; for example, *Camptocerus* Erichson (Scolytini), *Scolytoplatypus* Schaufuss (Scolytoplatypini), *Bothrosternus* Eichhoff (Bothrosternini), *Hyleops* Schedl (Hylesinini), and numerous genera in the more highly evolved tribes Xyleborini, Xyloterini, and Corthylini. For this reason, the appearance of the ambrosial habit very early in scolytid phylogeny is not unusual.

Every character on which the family Platypodidae is based, whether anatomical, behavioral, or ecological, intergrades with the Scolytidae. The only justification I see, at present, for retaining it as a family separate from Scolytidae is tradition and the fact that most forms encountered in the field are easily recognized.

Scolytidae

As conceived here, the family Scolytidae consists of the two subfamilies Hylesininae and Scolytinae (including Ipinae). The adult forms of Scolytidae (1) have a definite pregula and pregular sutures, (2) lack a spherical head and rostrum, (3) have a distinctive mandibular articulation (quite different from curculionids?), (4) never have a petiolate point of labial articulation, and (5) have tibiae that are adapted to a bark- or wood-boring habit and, in primitive forms, are no more similar to Cossoninae than they are to those of certain Brenthidae. In part, the similarity between Scolytidae and Rhyncolini is due to convergence or more probably to parallel evolution that commenced when both groups entered part of the same broad ecological niche. The short pseudorostrum of the Hylastini and allied forms of Hylesininae appears to have been acquired independently and differs in fundamental structural detail from that seen in Curculionidae (Figures 1-7).

The division of the Scolytidae (including Platypodidae) into three major lines of development occurred very early in its phyletic history but well after the basic characteristics of the group were established. The earliest living genera representing those lines, *Protoplatypus* and possibly *Mecopelmus* for Platypodidae, *Protohylastes*, and, doubtfully, certain *Cnemonyx* (*galeritus* Eichhoff) for Hylesininae, could appropriately be placed as primitive Scolytinae since they are intermediate and lack some of the most diagnostic characters of the groups I presume they represent.

The argument for the above classification, and also for the retention of Platypodidae and Scolytidae as families, must be considered tentative and biased. It is based largely on a limited number of external adult characters. The larvae, habits, and internal characters of most primitive genera of concern are totally unknown. Collecting experience in tropical areas has demonstrated that specimens of these primitive genera are exceedingly rare and suggests that several more equally rare genera await discovery. It should also be mentioned that in a review of this problem careful attention should be given to the sporadic occurrence of a very short antennal scape, broadly bilobed tarsi, scalelike vestiture, gnathal, and other characters commonly found in primitive genera of these groups. The significance of a complete gula, with two totally separate gular sutures found in several species of the neotropical genus *Gnathotrupes* (Scolytidae) (Figure 12), and the possible cercus-like structures and the tenth abdominal segment of larval platypodids, cited above, must also be investigated. Convergent and parallel evolution among wood-boring Curculionoidea must be examined very carefully in order to sift the meaningful from the misleading superfluous characters found in these families.

Among primitive Coleoptera the tentorial structure arises from two separate tentorial pits on the gular sutures about midway between the foramen magnum and the oral fossa (Stickney, 1923). From these pits the posterior tentorial bridge arises, forming a clearly identifiable internal landmark. The anterior tentorium extends forward from this point for some distance, then branches to form (1) the dorsal arms that extend to but do not fuse with the wall of the head near the anteromesal margin of the eye (connected by ligaments only) and (2) the anterior arms that extend to the anterior tentorial pits near the anterior articulation of the mandibles. In all Curculionoidea having an anterior tentorium the anterior arms extending to the anterior tentorial pits are entirely absent. The dorsal arms vary from well-developed to obsolete. The posterior tentorium in Curculionoidea is carried inward on a Y-shaped apodeme having a median basal portion arising from the median gular suture from the posterior tentorial bridge to the postgula; the two arms of this basal piece branch from its inner margin. The anterior extremity of this internal gular structure forms a single median pillar in all Curculionoidea having a single gular suture and lacking pregular sutures (Figures 1-4). In all Platypodidae and Scolytidae this anterior tentorial structure forms two pillars that continue antero-

laterally along the strongly inflected apodemal ridges formed by the pregular sutures (Figures 5-19). In my opinion this character alone is sufficiently unique and striking, in combination with the external pregular sutures, to warrant family recognition of the group represented by the Platypodidae and Scolytidae.

Summary and Conclusions

The tibial and other characters used as a basis for reducing the Platypodidae and Scolytidae to subfamilies of Curculionidae (Crowson, 1967; Kuschel, 1966) were adaptive characters not found in primitive representatives of the group.

A definite pregula clearly defined by sutures associated with an internal inflection of the cuticle occurs in Platypodidae and Scolytidae but not in any other Curculionoidea having only one gular suture. It is postulated that pregular sutures occur only in those groups in which a rostrum is lacking and has never been developed; therefore, since pregular sutures are absent in all groups with a rostrum, or in which it was secondarily lost, their absence indicates a specialization.

One genus of Platypodidae has the adult maxillary palpus 4-segmented. Since no known representative of the Curculionidae (s. str.) has more than a 3-segmented palpus, the ancestral stock from which the Platypodidae were derived must predate that of the Curculionidae.

Three of the most primitive genera of Platypodidae for which habits are known are either phloeophagous or xylophagous and are not associated with an ambrosial fungus. Since the ambrosial habit has arisen independently many times in the Scolytidae on almost every major phyletic line, it is postulated that the platypodids arose very early from the Scolytidae and now constitute an aberrant group within or very near that family. Tibial, tarsal, and gnathal characters in primitive genera also tend to intergrade in the two groups. Therefore, three major, equally distinctive phyletic lines of development are recognized in Platypodidae (including Coptonotidae), Hylesininae, and Scolytinae (including Ipinae). Platypodidae is tentatively retained as a family separate from Scolytidae for reasons of tradition until exhaustive studies clearly indicate the need for a change.

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