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**A revision of the lotic genus *Potamyia* BANKS 1900  
(Trichoptera: Hydropsychidae)  
with the description of eight new species**

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**A b s t r a c t :** The taxonomic position, ecology and distribution of the lotic genus *Potamyia* BANKS are revised. The previous distribution of the genus in N. America and the Oriental region is greatly extended, with six species discovered in Madagascar. Of the 42 species now recognised, eight are described as new: *P. ifanadiana* nov.spec., *P. tofina* nov.spec., *P. andoba* nov.spec., *P. karafa* nov.spec., *P. andria* nov.spec., *P. korasha* nov.spec., *P. nuonga* nov.spec., *P. trenhona* nov.spec. Five species are transferred to the genus: *P. chekiangensis* (SCHMID), *P. dentifera* (ULMER), *P. pallidipennis* (MARTYNOV), *P. hoenei* (SCHMID), *P. nikalandugola* (SCHMID). Five new species synonymies are established.

**K e y w o r d s :** Trichoptera, Hydropsychidae, *Potamyia*, Taxonomy, Madagascar, Oriental, new species.

### Introduction

*Potamyia* was erected by BANKS (1900) as a new hydropsychid genus near to *Macronema*, with *Macronema flavum* HAGEN 1861, a species living in large North American rivers, as the type-species. ULMER (1912) described a fossil species, *P. nitida* from Baltic amber, but according to MARTYNOV (1930) this Eocene hydropsychid probably belongs in *Hydropsyche*. The only other species known in the genus until recently were *P. chinensis* (ULMER), *P. trilobata* (ULMER), here recognised as a synonym of *P. straminea* (MCLACHLAN), and *P. yunnanica* (SCHMID), all known from China, together with *Cheumatopsyche czezanovskii* MARTYNOV known as an abundant potamobiont in the large Siberian rivers (recorded from Mongolia and transferred to *Potamyia* by SCHMID 1967, with females recorded from Korea by BOTOSANEANU (1970). Later TIAN & LI (1987) listed and named three new species of *Potamyia* in a preliminary study on the subfamily Hydropsychinae in China, but as they lack descriptions or figures these names are unavailable, being nomina nuda (NIMMO 1988). During the last few years H. MALICKY and his coworkers (1997, 1998, 2000, 2000a, 2001) described 17, and Chinese trichopterologists (LI & TIAN 1996, GUI & YANG 1999) three new species, including the three nomina nuda of this formerly small genus. During the 1980s J. Oláh made large collections of caddisflies from Vietnam, India and Madagascar, and eight new species are described here. The recent descriptions and new species of *Potamyia* enable us to clarify

the taxonomic status of this genus which forms huge biomasses in the large rivers of North America and Asia.

### Abbreviations of type depositories

The type material of species described in this paper is in the J. Oláh collection, except where indicated otherwise.

BMNH .....	The Natural History Museum, London, UK
MAK .....	Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn, Germany
MCZ.....	Museum of Comparative Zoology, Harvard, Massachusetts, USA
MNHU .....	Museum für Naturkunde an der Humboldt-Universität zu Berlin, Germany
NMNH .....	National Museum of Natural History, Washington DC, USA
ZI.....	Zoological Institute, St. Petersburg, Russia
ZMH .....	Zoologisches Institut und Zoologisches Museum, Hamburg, Germany

### Taxonomic position

*Potamyia* is a true member of the subfamily Hydropsychinae but, having the very elongate antennae so characteristic of the Macronematinae, its similarity to the genus *Macronema* was emphasized when it was first described (BANKS 1900). More recent descriptions of the genus (e.g. ROSS & UNZICKER 1977; SCHMID 1980) have been based on the few species known at that time. *Potamyia* exhibits a confusing range of characters, some shared with the Macronematinae, and some with the genera *Hydropsyche* and *Cheumatopsyche*, but we can now give the following generic description based on the large number of species now known:

Head globular, face convex, malar space large; antennae long and narrow (between just less than 1.5 to 2 times length of forewing), with scape globular. Forewing with Sc and R1 thickened; Cu2 and A confluent before wing margin; crossveins Sc-R1 and R1-R2+3 absent; crossveins M3+4-Cu1 and Cu1-Cu2 very close. Hindwing with Sc and R1 confluent at about discoidal cell; fork f1 present; median cell open (except *P. flavata*, new record from Vietnam possibly aberrant); stems of Cu1 and M almost touching and running parallel (except *P. andoba*). Tarsal claws asymmetrical (except *P. andoba*), covered with dark bristles. Spur formula usually 044, but 144 or 244 in some species. Male genitalia: tenth tergum long, terminating in two hook-shaped lobes without median process; phallobase greatly enlarged at base; endotheca represented by pair of latero-ventral lobules.

There is no single diagnostic character which is exclusively present in all species but members of the genus can be recognised by the combination of venational and genitalic characters given above, together with the long antennae. One or more of these characters may be absent in a particular species, and some also occur in other genera of Hydropsychinae, but never all together. There is nothing surprising in the lack of exclusive diagnostic features if we take into consideration the dynamic nature of structural development during the evolution of the isolated representatives of the genus.

### Habitat and ecology

Since there were previously only four known species our knowledge of the biology and

ecology of *Potamyia* was very limited. According to ROSS (1944) enormous numbers of the net-spinning larvae of *P. flava* populate large rivers (Fig. 52) and the more sluggish lower portions of large streams in eastern North America. Flying adults appear in huge swarms along such rivers as the Illinois, Mississippi and Ohio. Emergence starts in May and continues through September. An interesting habit of the species is that instead of hiding under rocks the larvae tend to frequent less rapid portions and construct their net retreats on the top of rocks or other solid surfaces. In his synopsis of the Canadian caddisflies SCHMID (1980) also states that *P. flava* prefers large rivers and its huge swarms locally create nuisance problems. On the other hand the aquatic larval stage forms the principal fish food resources in these large rivers. Like other hydropsychids, *P. flava* submerges to oviposit (DEUTSCH 1984). Ovipositing females with mature eggs or without eggs were collected in an underwater light trap and hydropsychid egg masses were found on objects submerged 8 metres deep in the Mississippi River. Ovipositing females were collected as deep as 7 metres. In laboratory experiments adult females were seen to remain submerged for several hours. After hatching the larvae construct loose nets, with the greatest concentrations in sandy silt-free areas of the river, preferring to colonise firm, rough objects such as stones lying partially buried in a sandy bottom. Larvae were collected in a water velocity range of 0.26-0.99 m sec<sup>-1</sup>. *P. flava* is one of the few hydropsychid larvae whose stridulatory habit has been studied (JOHNSTONE 1964). The stridulatory organ consists of a file on the head and a scraper on the front femora. Two possible functions of stridulation can be inferred: to repel predators or to defend territories. Stridulation may have importance in such reaches of the rivers where *Potamyia* lives and competes for limited numbers of suitable solid surface habitats.

*P. czekanovskii* lives in the large Siberian rivers Yenisey, Ob, Angara, Tunguzka and Amur. Its larvae are widely distributed and abundant in the rivers of the Yenisey River Basin (LEPNEVA 1948). They populate the middle and lower portions of these rivers from the riparian to a depth of 13 metres and avoid rapids and riffles of high water current. Their net-spun retreats, similar to those of *P. flava*, are attached to solid surfaces. The flow velocity where *P. czekanovskii* larvae inhabited the river bed ranged between 0.7-1.8 m sec<sup>-1</sup>. They were more dominant at lower flow velocities and they were found only three times in benthic samples above 1.2 m sec<sup>-1</sup> during an intensive sampling survey in the Yenisey River Basin (LEPNEVA 1948). *P. czekanovskii* is an important member of the drifting caddisfly community in the Amur River, reaching 27% of the total caddisfly drift. Drift begins after the break-up of the ice and gradually increases, reaching a maximum from June to the beginning of August and fades away by the end of October (LEVANIDOV & LEVANIDOVA 1979). *P. straminea* lives primarily in the lowland rivers of Turkestan (MARTYNOV 1934). *P. chinensis*, originally described from northern China lives also in the large River Amur, in its portion below Chabarowsk (MARTYNOV 1934).

The situation in southeastern Asia seems rather different, however (Malicky, unpublished). Obviously several widespread species may live in large, low-running rivers, but the majority of species does not. Only four species were found in River Ping, northern Thailand, of the 13 species known so far in Thailand (CHAIBU et al. 2002). Several species have been collected in mountain streams at altitudes up to 1500m, often with a high water velocity. These include *P. alleni*, *P. aureipennis* (Fig. 50), *P. baenzigeri* (Fig. 48), *P. horvati* and *P. peitho*. Some species are found in small woodland streams, including *P. elektra*, *P. euadne* and *P. epigona* (Fig. 46), whereas *P. huberti* (Fig. 51) is in fast streams but at lower altitudes. *P. flavata* is found in large rivers and smaller stony

streams (Fig. 47), though usually at lower altitudes (it also came to light near the large Red River at Hanoi and near the Da River in northern Vietnam), and *P. siveci* is in similar habitats in Sumatra. *P. panakeia* (Fig. 49) and *P. phaedra* are also found in large and small rivers, but at higher altitudes. No information is available on the habitats of *P. periboia*, *P. chaos* or *P. dryope*. *P. renatae* (Fig. 53) and *P. arachne* are both found in larger lowland rivers in Nepal, and Oláh has collected *P. arachne* at light by the riparian of the River Daya, a large lowland tributary of the River Mahanadi, which is the largest river in Orissa State, India. *P. daphne*, the other Indian species of the genus inhabits large rivers in the southern Indian states: the Cauvery River system in Tamil Nadu and the Sharavati River in Karnataka. *P. nikalandugola* populates the sluggish, foothill reaches of the less rapid and less turbulent rivers (SCHMID 1958). Whether the magnitude of *Potamyia* populations in these large monsoon-fed warm rivers is comparable to the huge biomass present in the North American and Siberian rivers remains unknown until these large rivers attract relevant ecological studies. In North Vietnam *P. chinensis* was collected near the Da River. In Southern Vietnam Oláh collected two species, *P. phaedra* and *P. trenhona* at light in the riparian zone of the medium sized Dai Binh and Da Nga Rivers which flow through Highland Nguyen.

The identification of possible larval habitats for the six new species from Madagascar is not easy. The available details of the localities do not include data for rivers or any other nearby waters. However, the mere location on the map shows that most of the collections are restricted to the coastal lowland or foothill territories. This may indicate that *Potamyia* species in Madagascar also prefer rivers and not mountain streams.

### Distribution

The discovery of six new species of the genus *Potamyia* in Madagascar, so far from the previously known area of distribution, and the description of several new species with several new combinations from the Oriental Region indicates a very interesting distribution for this genus, including North America, southeastern Asia and Madagascar. At this stage it is difficult to speculate about the historical development of the genus, but we may assume that the most ancestral representatives of the genus populate Madagascar (the *P. ifanadiana*-group) with the more peripheral area of recent distribution populated by the *P. flava*-group. The most vigorous speciation has occurred in S.E. Asia and South China, resulting in eighteen known species.

### Taxonomy

*Potamyia* BANKS 1900: 259. Type species: *Macronema flavum* HAGEN 1861: 285 by original designation.

*Synaptopsyche* ULMER 1951: 250-251. Type species: *Hydropsyche dentifera* ULMER 1930: 439 by original designation. Synonymised by MALICKY (1997).

**Check-list of species of *Potamyia******P. ifanadiana*-group**

*P. andoba* nov.spec.  
*P. andria* nov.spec.  
*P. ifanadiana* nov.spec.  
*P. karafa* nov.spec.  
*P. korasha* nov.spec.  
*P. tofina* nov.spec.

***P. flava*-group**

*P. aureipennis* (ULMER 1930)  
*P. baenzigeri* MALICKY & CHANTARAM. 1997  
*P. elektra* MALICKY & CHANTARAMONGKOL 2001  
*P. epigona* MALICKY & CHANTARAM. 2001  
*P. flava* (HAGEN 1861)  
    = *P. kansensis* (BANKS 1906)  
*P. fulvescens* (NAVÁS 1932)  
*P. huberti* MALICKY 1997  
*P. nuonga* nov.spec.  
*P. ovalis* GUI & YANG 1999  
*P. panakeia* MALICKY 1997  
*P. psamathe* MALICKY 2004  
*P. renatae* MALICKY 1997  
*P. straminea* (MCLACHLAN 1875)  
    = *P. trilobata* ULMER 1932 syn. n.

***P. chinensis*-group**

*P. chekiangensis* (SCHMID 1965) comb.n.  
    = *P. parva* TIAN & LI 1987 syn.n.  
*P. chinensis* (ULMER 1915)  
    = *P. echigoensis* (TSUDA 1949) syn.n.

    = *P. tienmuisi* (SCHMID 1965) syn. n.

*P. dentifera* (ULMER 1930) comb.n.  
*P. dryope* MALICKY & THANI 2000  
*P. pallidipennis* (MARTYNOV 1935) comb. n.  
*P. periboia* MALICKY & CHANTARAM. 1997

***P. trenhona*-group**

*P. arachne* MALICKY 1998  
*P. chaos* MALICKY & THANI 2000  
*P. daphne* MALICKY 1998  
*P. hoenei* (SCHMID 1965) comb.n.  
*P. jinhongensis* LI & TIAN 1996  
*P. phaidra* MALICKY & CHANTARAM. 1997  
*P. siveci* MALICKY 1997  
*P. trenhona* nov.spec.  
*P. yunnanica* (SCHMID 1959)

***P. czezanovskii*-group**

*P. alleni* MALICKY & CHANTARAMONGKOL 1997  
*P. bicornis* LI & TIAN 1996  
*P. czezanovskii* (MARTYNOV 1910)  
*P. euadne* MALICKY & SAENGPRADAB 2001  
*P. flavata* (BANKS 1934)  
    = *P. klakahana* (ULMER 1951) synonymised  
    by MALICKY (1997)  
    = *P. proboscida* LI & TIAN 1996  
*P. horvati* MALICKY & CHANTARAM. 1997  
*P. nikalandugola* (SCHMID 1958) comb.n.  
*P. peitho* MALICKY & CHANTARAMONGKOL 1997

**The *P. ifanadiana*-group**

This group contains the largest-sized species of the genus. All are dark pigmented, more or less fuscous, unlike the other groups which are yellow or yellowish-brown in colour. The antennae are also very long, up to twice length of forewing. Ninth abdominal segment robust and very rounded anterolaterad, dorsum reduced, apical lobe on posterolateral margin well developed with broad base and rounded apically. Basal segment of clasper very robust and straight with dilated base. Tenth tergum small compared to ninth segment, elongated horizontally with weakly developed hook formation; setose warts elevated and situated near middle of tergum. The species *P. ifanadiana*, *P. tofina*, *P. andoba*, *P. karafa*, *P. andria* and *P. korasha* comprise this group; all are restricted to Madagascar.

***Potamyia andoba* OLÁH & BARNARD nov.spec. (Fig. 1)**

Male (in alcohol). General colour dark fuscous, head and thoracic sclerites almost piceous. Antennae broken. Spur formula 244; tarsal claws symmetrical, not hidden in bunch of black bristles. Forewing 6 mm. Venation with several differences from the typical *Potamyia* pattern: crossveins M3+4-Cul and Cul-Cu2 almost touching, crossvein Cul-Cu2 slightly basad of M3+4-Cul, Cu2 and A joining before C, crossveins Sc-R1 and R1-R2+3 present, sclerotized pterostigmal area enlarged. In hindwing stem of M plus

proximal part of M3+4 not touching, well separated but parallel with Cu1, fork 1 present, Sc and R1 joining well before crossvein R2+3-R4.

Male genitalia. Ninth abdominal segment annular, anteriorly rounded with abruptly narrowing lateroventral corner. Dorsum narrow, median keel short and visible in dorsal view as a small median triangular projection. Apical lobe on posterolateral margin developed into a rounded, almost semicircular lobe shifted towards the middle of the segment and not covering the clasper base. Tenth tergum elongated horizontally with triangularly excised bifid apex curved up and outwards. Setose warts well developed, elevated, coalesced and occupying the whole basal half of the tenth tergum. Basal segment of clasper slender, almost parallel-sided especially in ventral view. Apical segment slightly bifid, ventral lobe more developed. Phallosome with elongated and enlarged base, dorsum concave and ending with abruptly upcurving margin at articulation with endothecal process; ventral surface sinuate. Subapical ventral keel well developed, dominating bulbous formation of caudal portion. Phallosomal sclerites well developed, compact and rounded both in lateral and dorsal views. Sclerous band of endophallus just visible. One pair of membranous lobules representing ventral endothecal process. Endothecal process forming caudal lips of the phallic apparatus semicircular, its articulation plane vertical, almost as wide as subapical portion.

This species is easy to distinguish from all others in the genus because of the combination of plesiomorphic characters: tibial spur formula 244; claws symmetrical; crossveins Sc-R1 and R1-R2+3 present; M and Cu not touching, well separated; and the large setose warts representing the fused superior (preanal) appendages). This species is named after the type locality.

*Holotype* ♂: Madagascar, Tulear Province, Antsalova District, Andobo, Antsingy forest, Natural Reserve, March 1959 (Paulian) (J. Oláh collection).

***Potamyia andria* OLÁH & BARNARD nov.spec. (Fig. 2)**

Male (in alcohol). General colour dark fulvous. Antennae 16.5 mm, twice length of forewing. Spur formula 044. Tarsal claws asymmetrical, outer one covered by bunch of black bristles. Forewing 8.2 mm. Crossveins M3+4-Cu1 and Cu1-Cu2 not touching, crossvein Cu1-Cu2 half its own length basad of M3+4-Cu1, Cu2 and A joining before C, crossveins Sc-R1 and R1-R2+3 absent, pale pterostigmal area enlarged. In hindwing, stem of M plus proximal part of M3+4 touching and running parallel with Cu1, fork 1 present, Sc and R1 joining only at level of crossvein closing discoidal cell (R2+3-R4).

Male genitalia. Ninth abdominal segment annular, anteriorly rounded, dorsum narrow, median keel short and visible in dorsal view as a small median triangular projection. Apical lobe on posterolateral margin developed into a semicircular lobe covering half base of clasper. Tenth tergum elongated horizontally with triangularly excised bifid apex slightly upcurved; tip heavily sclerotized, almost hook-like. Setose warts moderately elevated, situated on middle of tenth tergum, well separated and obliquely elongated. Clasper with basal segment straight, almost parallel-sided in both lateral and ventral views, apical segment short, strongly curved medially, clearly bifid. Phallosome with elongated and enlarged base, dorsum oblique in lateral view and strongly upcurved at articulation with endothecal process; ventral surface strongly sinuate. Subapical ventral keel short, lightly sclerotized. Phallosomal sclerite small, not tapering to apex. Sclerous band of endophallus well developed and touching phallosomal sclerites. Lobules of

ventral endothecal lobe membranous and small but visible in both lateral and dorsal views. Endothecal processes forming caudal lips of phallic apparatus semicircular, articulation vertical and covering whole caudal end of phallic apparatus.

This species is close to *P. tofina*, but the clasper is slender not robust, the apical segment of the clasper is more bifid, and the setose warts are more elevated. The phallic dorsum is oblique not straight, and there are no additional subapical lobules on the ventral endothecal lobe. There are also many differences in wing venation as described, and the overall size is much smaller. This species is named in honour of the collector, R. Andria.

**H o l o t y p e** ♂: Madagascar, North District Diego Suarez, Analamerana, 80 m a.s.l., 50 km S.E. of Diego Suarez, January 1959 (Andria) (J. Oláh collection).

***Potamyia ifanadiana* OLÁH & BARNARD nov.spec. (Fig. 3)**

Male (in alcohol). General colour fulvous. Antennae 29 mm, more than twice length of forewing. Spur formula 044 (244 in female). Tarsal claws asymmetrical (symmetrical in female) partly covered with light bristles. Forewing 13 mm. Crossveins M3+4-Cu1 and Cu1-Cu2 not touching, crossvein Cu1-Cu2 more than its own length basad of M3+4-Cu1, Cu2 and A joining before C, crossveins Sc-R1 and R1-R2+3 absent in holotype but present in atrophied form in some paratypes, pterostigmal area enlarged. In hindwing, stem of M plus proximal part of M3+4 touching and running parallel with Cu1, fork 1 present, Sc and R1 joining only at around crossvein R2+3-R4.

Male genitalia. Ninth abdominal segment annular, anteriorly rounded, dorsum narrow, median keel very short. Apical lobe on posterolateral margin developed into semicircular lobe covering half base of clasper. Tenth tergum elongated horizontally with quadrangularly excised bifid apex. Setose warts elevated and enlarged but separate and located around middle of tergum. Clasper basal segment almost parallel-sided. Caudal segment short with rounded apex except for small, medially directed, pointed projection. Phallosome with elongated and enlarged base, dorsum and ventrum straight, resulting in parallel-sided central portion. Dorsal distal portion upcurved and covered by endothecal processes. Phallosomal sclerites large and rounded; end of sclerous band of endophallus heavily sclerotized and clearly visible. Subapical ventral keel short and so wide that almost globular endothecal processes do not cover whole ending of phallosome. Lobules of ventral endothecal lobe very large.

This is the largest known *Potamyia* species, easily distinguished simply by its size and by the peculiar ending of the phallic apparatus, especially the large lobules of the ventral endothecal lobe. The species was collected from five locations in the central region of East Madagascar, and is named after the type locality.

**H o l o t y p e** ♂: Madagascar, Ifanadiana, Ranomafana, March 1955 (Paulian). **P a r a t y p e s** : 6♂♂ 5♀♀: same data as holotype; 2♂♂: Madagascar, Ampangalambolosy, 9 October 1957 (Soga); 1♂ Madagascar, Anivoraus Kely, Riviera Ivoay, Brickaville, September 1954 (Paulian), 6♂♂: Madagascar, Perinet, September 1954 (Viette & Paulian); 1♂ 2♀♀: Madagascar, Anosibe, 1955 (Paulian). (All in J. Oláh collection).

***Potamyia karafa* OLÁH & BARNARD nov.spec. (Fig. 4)**

Male (in alcohol). General colour dark fulvous. Antennae 19 mm, twice as long as forewing. Spur formula 144. Tarsal claws asymmetrical, outer one covered by bunch of

black bristles. Forewing 9.5 mm. Crossveins M3+4-Cu1 and Cu1-Cu2 not touching, crossvein Cu1-Cu2 one-and-a-third its own length basad of M3+4-Cu1, Cu2 and A joining before C, crossveins Sc-R1 and R1-R2+3 absent, pale pterostigmal area enlarged. In hindwing, stem of M plus proximal part of M3+4 touching and running parallel with Cu1, fork 1 present, Sc and R1 joining only at around crossvein closing discoidal cell (R2+3-R4).

Male genitalia. Ninth abdominal segment annular, anteriorly regularly rounded, dorsum narrow, median keel long and visible in dorsal view as an elongated median process. Apical lobe on posterolateral margin not strongly developed, but with additional small lobes visible above it. Tenth tergum elongated horizontally with narrow excision forming very characteristic bifid apex, both lobes large, broad and rounded on both sides, resulting in significant subapical narrowing of tenth tergum in dorsal view. Setose warts not elevated, well separated on middle of tergum. Clasper moderately robust, basal segment widening after midpoint, caudal segment with blunt rounded apex except for medially directed pointed tip on apex. Phallosome with elongated and enlarged base, dorsum very straight up to the tip of the phallus without upcurving. Ventral surface more triangular than sinuate. Subapical ventral keel not wide but very long, forming triangular configuration of the ventrum. Phallosomal sclerites vertically elongated and rounded. Sclerous band of endophallus just visible. Lobules of ventral endothelial lobe very small, membranous. Endothelial process elongated, semicircular and shifted to a more vertical position so its articulation plane is not vertical but ventrally oblique; a sharp narrowing at ventral meeting plane of endothelial process and distal end of subapical ventral keel.

This species is most closely related to *P. korasha* but has the spur formula 144, and differs in the venation, phallic apparatus and tenth tergum. The species is named after part of the type locality.

H o l o t y p e ♂: Madagascar, Ampijoroa, Forest Ankarafantsika, 30 August 1956 (Griveaud). (J. Oláh collection).

#### ***Potamyia korasha* OLÁH & BARNARD nov.spec. (Fig. 5)**

Male (in alcohol). General colour fuscous. Antennae 12 mm, less than twice length of forewing. Spur formula 044 (244 in female). Tarsal claws asymmetrical, outer one covered by bunch of black bristles (symmetrical and free in female). Forewing 8 mm. Crossveins M3+4-Cu1 and Cu1-Cu2 not touching, crossvein Cu1-Cu2 exactly its own length basad of M3+4-Cu1, Cu2 and A joining before C, crossveins Sc-R1 and R1-R2+3 absent, pterostigmal area enlarged, less pigmented in holotype, but heavily pigmented in paratype. In hindwing, stem of M plus proximal part of M3+4 almost touching and running parallel with Cu1, fork 1 present, Sc and R1 joining only at around the crossvein closing discoidal cell (R2+3-R4).

Male genitalia. Ninth abdominal segment annular, anteriorly rounded, slightly narrowed in lateroventral corner, dorsum narrow, median keel connecting ninth and tenth tergum long and visible in dorsal view as elongated median process. Apical lobe on posterolateral margin developed, not covering half of clasper. Tenth tergum elongated horizontally with well-developed upcurved hook-like bifid apex. Excision broad and triangular. Setose warts very elevated, separated and situated on middle of tergum. Clasper moderately robust, basal segment widening after midpoint, caudal segment with pointed ventral tip. Phallosome with elongated and enlarged base; dorsum straight, whole distal portion



upcurved without widening rim at articulation with endothecal process. Ventral surface sinuate. Subapical ventral keel well developed, long, contributing to bulbous configuration of phallic distal portion. Phallotremal sclerites large, rounded without tapering apex. Sclerous band of endophallus just visible. Lobules of ventral endothecal lobe long, occupying most of subapical ventral keel. Endothecal process semicircular, its articulation plane vertical, occupying whole end of phallic apparatus.

This species is distinguishing from all others in the genus by the well-separated, hook-like and upcurved bifid apex of the tenth tergum, the long lobules of the ventral endothecal lobe and the upcurved distal end of the phallic apparatus. This was the first *Potamyia* species discovered in Madagascar. Accordingly it is named as 'distant' from the known distribution of the genus, 'korasha' meaning distant in Sanscrit.

**H o l o t y p e** ♂: Madagascar, Moheli Island, October 1955 (Paulian). **1 ♂ p a r a t y p e**: Moheli Island, Fomboni, at residence light, June 1954 (Millot and Paulian). (All in J. Oláh collection).

***Potamyia tofina* OLÁH & BARNARD nov.spec. (Fig. 6)**

Male (in alcohol). General colour fuscous. Antennae 19 mm, less than twice length of forewing. Spur formula 044. Tarsal claws asymmetrical, outer one covered by bunch of black bristles. Forewing 12 mm. Crossveins M3+4-Cu1 and Cu1-Cu2 not touching, crossvein Cu1-Cu2 twice its own length basad of M3+4-Cu1. Cu2 and A joining before C, crossveins Sc-R1 and R1-R2+3 absent, pterostigmal area enlarged and heavily granulated. In hindwing stem of M plus proximal part of M3+4 running close to and parallel with Cu1, fork 1 present, Sc and R1 joining well before the crossvein closing discoidal cell (R2+3-R4).

Male genitalia. Ninth abdominal segment annular, anteriorly rounded in lateral view with narrowing dorsum and excised lateroventral corner; dorsum extremely narrow without visible median keel. Apical lobe on posterolateral margin rounded, subtriangular, covering half base of clasper. Tenth tergum elongated horizontally with triangularly excised bifid and scarcely upcurved apex; extreme tip short, stout and more sclerotized. Setose warts flat, not elevated, medially located, well separated. Clasper with basal segment robust, proximal third narrow and widening apically. Apical segment short and bifid, its upper lobe more developed. Phallotrocha with elongated and enlarged base, dorsum straight in lateral view, caudal portion upcurved and projecting distally; articulation of endothecal process oblique. Ventral surface with regular sinus; subapical ventral keel long, not strongly sclerotized. Phallotremal sclerite well developed and rounded in both lateral and dorsal views. Sclerous band of endophallus not clearly visible. Two pairs of lobules (ventral endothecal process), one at distal end of subapical ventral keel as usual for the genus, the other at middle of keel. Endothecal process forming caudal lips of phallic apparatus semicircular, articulation plane not vertical but oblique, covering most of caudal end of phallic apparatus.

This species can be distinguished from *P. andria*, the other species having a bifid caudal clasper segment, by the robust clasper, flattened setose warts, straight phallic dorsum, much longer ventral keel and the additional subapical lobules of the ventral endothecal lobe. There are many differences in wing venation as described, and the size is more than double that of *P. andria*. This species is named from part of the type locality.

**H o l o t y p e** ♂: Madagascar, District Fianarantsoa, Ambatofinandrahnana, July 1957 (Paulian); **3 ♂ p a r a t y p e s**, same data as holotype. (All in J. Oláh collection).

### The *P. flava*-group

This group is almost certainly not monophyletic, as the characters that are shared by its members are not demonstrably synapomorphic. Nevertheless it is retained as a convenient grouping with the following characteristics. Medium-sized species. The ninth segment narrow, without apicolateral enlargement, apical lobe on posterolateral margin absent or little developed. Basal segment of clasper sinuate. Tenth tergum with very small hook formation, variable in position. Setose warts located mid-way on tenth tergum, or slightly apically. The thirteen species in this group are *P. aureipennis*, *P. baenzigeri*, *P. elektra*, *P. epigona*, *P. flava*, *P. fulvescens*, *P. huberti*, *P. nuonga*, *P. ovalis*, *P. panakeia*, *P. psamathe*, *P. renatae* and *P. straminea*; distributed in central and southeastern Asia and North America.

#### *Potamyia aureipennis* (ULMER) (Fig. 7)

*Hydropsychodes aureipennis* ULMER 1930: 447-449. Holotype ♂, Sumatra: Fort de Kock, 920 m., April 1921 (Jacobson) (ZMH, examined).

*Synaptopsyche aureipennis* (ULMER); ULMER 1951: 252.

Antennal length unknown. Spur formula 044. In forewing crossveins Cu1-Cu2 and M3+4-Cu1 touching. In hindwing veins M and Cu1 almost touching; fork 1 present. In the male genitalia, the setose surface on the tenth tergite is in a basal position, as in the more primitive members of the genus. In this respect it resembles *P. nuonga* nov.spec. but the hook formation is different and the endothecal process is much longer.

#### *Potamyia baenzigeri* MALICKY (Fig. 8)

*Potamyia baenzigeri* MALICKY 1997: 1035, 1055. Holotype ♂: Thailand, Jaeson NP, Nam Mae Mon, 10-11. January 1997 (H. Malicky).

#### *Potamyia elektra* MALICKY & CHANTARAMONGKOL (Fig. 9)

*Potamyia elektra* MALICKY & CHANTARAMONGKOL, MALICKY et al. 2001: 13. Holotype ♂: Thailand, Prov. Mae Hong Son, Muang Pai Resort (5 km NW Pai), 800m, 19°23'N, 98°24'E, 10-27 January 2000 (Malicky).

#### *Potamyia epigona* MALICKY & CHANTARAMONGKOL (Fig. 10)

*Potamyia epigona* MALICKY & CHANTARAMONGKOL, MALICKY et al. 2001: 12-13. Holotype ♂: Thailand, Prov. Mae Hong Son, Huai Pang Paek (14 km NW Pai), 1200m, 19°26'N, 98°20'E, 27 April 2000 (Malicky).

#### *Potamyia flava* (HAGEN) (Fig. 11)

*Macronema flava* HAGEN 1861: 285. Lectotype ♂, USA: Missouri, St. Louis, 1859 (Sacken) (MCZ, not examined) designated by ROSS 1938: 19.

*Potamyia flava* (HAGEN); BANKS 1900: 259.

*Hydropsyche kansensis* BANKS 1906: 15 (synonymised by MILNE 1936: 73).

Antennae 1.5 times length of forewing. In forewing crossveins Cu1-Cu2 and M3+4- Cu1 touching. In hindwing veins M and Cu1 almost touching; fork 1 present. Spur formula 044. This is the single representative of the genus in North America. It most closely resembles *P. straminea*, but differs in having a bifid, not tapering, apical segment of the

clasper, a broader tenth tergite and a less-developed hook formation. It also resembles members of the Madagascan *P. ifanadiana*-group, but has the setose surface of the tenth tergite placed more distally, the hook formation more pronounced, and the apical lobe on the posterolateral margin of the ninth segment less developed.

The species has been recorded from many states of North America, with descriptions of the larva by ROSS (1944) and WIGGINS (1977).

***Potamyia fulvescens* (NAVÁS) (Fig. 12)**

*Ulmeria fulvescens* NAVÁS 1932: 942-943. Holotype ♂: Chapa, Tonkin (Gételot).

*Potamyia fulvescens* (NAVÁS), MEY 1998: 14-15. Lectotype ♂: Chapa (= Sa Pa), Tonkin (Gételot) (MNHN, Paris). 3 ♂♂: Fan Si Pan, 1600m, 22-29 April 1995 (V. Sinaiev).

***Potamyia huberti* MALICKY (Fig. 13)**

*Potamyia huberti* MALICKY 1997: 1036, 1055. Holotype ♂: Vietnam, Nam Cat Tien, 200m, 17-25 June 1995, (H. Malicky).

***Potamyia nuonga* OLÁH & BARNARD nov.spec. (Fig. 14)**

Male (in alcohol). General colour pale yellowish. Antennae 9 mm, 1.5 times length of forewing. Spur formula 044. Tarsal claws asymmetrical, covered with bristles. Forewing 5.8 mm. In forewing, crossveins M3+4-Cu1 and Cu1-Cu2 touching but not in a linear arrangement, Cu2 and A joining before C, crossveins Sc-R1 and R1-R2+3 absent, pale pterostigmal area enlarged. In hindwing stem of M plus proximal part of M3+4 almost touching and running parallel with Cu1, fork 1 present, Sc and R1 joining well before crossvein R2+3-R4.

Male genitalia. Ninth abdominal segment annular, anteriorly rounded except dorsal corner truncate, dorsum not narrowing more than ventrum, apical lobe on posterolateral margin absent, except for dorsal corner of sharp excision at base of clasper. Tenth tergum elongate and enlarged basally, subtriangular both in lateral and dorsal views, apex with small rounded excision forming a pair of upturned, recurving small projections; setose warts coalesced into an arciform transverse ridge situated at middle of tergum. Clasper moderately robust; basal segment broadening apically, apical segment long, distal half parallel-sided. Phallosome with elongated and enlarged base; dorsum straight, but apical third lowered. Ventral surface sinuate as far as long ventral keel; lowered dorsal portion coinciding with long, well-developed ventral keel, forming geniculate, distal broadening of the phallic apparatus. Phallosomal sclerites horizontal, apparently continuation of sclerous band of endophallus. Lobules of ventral endothecal lobe small, circular, situated at typical ventrodistal position on the ventral keel. Endothecal process subreniform, occupying whole ending of the phallic apparatus.

This species is distinguished from all others in the genus by the coalesced setose warts forming an arciform transverse ridge on the middle of the tenth tergum and by the enlarged distal third of the phallic apparatus. The central position of the setose warts of preanal (superior) appendages is characteristic for the Madagascan species and is apparently a plesiomorphic character. In all other non-Madagascan species the setose warts are situated more distally and also form a more complex pattern. This interesting member of the genus is named after the tribe living around the collecting place, Nuong.

**H o l o t y p e** ♂: Vietnam, Moc Chau National Reserve, 25 October 1986, at light (Oláh).  
**P a r a t y p e** ♂: Vietnam, Bac Thai Province, Quang Chu, 24-25 May 1987, at light (Oláh).  
 (All in J. Oláh collection).

***Potamyia ovalis* GUI & YANG (Fig. 15)**

*Potamyia ovalis* GUI & YANG 1999: 20. Holotype ♂: China, Yunnan Province, Nanlan River, 2 km south of Daluo town of Menghai County, 620m, 22 July 1995, (Sun Changhai & Wang Beixin).

***Potamyia panakeia* MALICKY & CHANTARAMONGKOL (Fig. 16)**

*Potamyia panakeia* MALICKY & CHANTARAMONGKOL, MALICKY 1997: 1036, 1053. Holotype ♂: Thailand, Doi Ithanon, Mae Klang, 400m, 11 April 1989 (H. Malicky).

***Potamyia psamathe* MALICKY (Fig. 17)**

*Potamyia psamathe* MALICKY 2004: 39-40. Holotype ♂: Iran, Prov. Busher, 24-25 October 2003 (Gyulai & Garai).

***Potamyia renatae* MALICKY (Fig. 18)**

*Potamyia renatae* MALICKY 1997: 1037, 1054. Holotype ♂: Nepal, Trisuli River, 600-750m (Allen).

***Potamyia straminea* (MCLACHLAN) (Fig. 19)**

*Cheumatopsyche straminea* MCLACHLAN 1875: 40-41. Syntypes ♂ ♀ Turkestan (Fedtshenko) (BMNH, examined).

*Potamyia straminea* (MCLACHLAN); TIAN & LI 1987: 128.

*Potamyia trilobata* ULMER 1932: 47-48. Lectotype ♂, China: Peking, August 1929 (Wu). (ZMH) here designated. **Syn.n.**

Antennae 1.5 times length of forewing. In forewing crossveins Cu1-Cu2 and M3+4-Cu1 touching. In hindwing veins M and Cu1 almost touching; fork 1 present. Spur formula 044. This species is close to *P. flava*, but the distal segment of the clasper is tapering, not bifid, the tenth tergum is narrower in dorsal view, the hook formation is more developed, ventrally positioned and curved outwards. The species is known from Turkestan, Afghanistan, Pakistan and from Aksu, Xinjiang autonomous region, North-West China (TIAN & LI 1987).

**The *P. chinensis*-group**

Pale or bright yellow species. Ninth abdominal segment narrow, moderately rounded anteriorly. Apical lobe on posterolateral margin absent or only slightly developed; dorsum very narrow. Basal segment of clasper geniculate except in *P. pallidipennis*. Tenth tergum long with pair of slightly upcurving ventrocaudal hooks. Setose warts situated at very top of tergum forming a very prominent pair of blunt and obtuse lobes. (In *P. chekiangensis* these lobes dominate the tenth tergum and the ventrocaudal hooks are absent). Six species, *P. chekiangensis*, *P. chinensis*, *P. dentifera*, *P. dryope*, *P. pallidipennis* and *P. periboia* comprise this group, which is distributed over north and south China, Japan and southeastern Asia.

***Potamyia chekiangensis* (SCHMID) comb. n. (Fig. 20)**

*Cheumatopsyche chekiangensis* SCHMID. 1965: 142-145. Holotype ♂, China, West Tien-mu-shan. 19 September 1932 (MAK, not examined) (1 ♂ paratype, same data, examined).

*Potamyia parva* TIAN & LI 1987: 128. Replacement name for *Hydropsychodes chinensis* MARTYNOV 1930. **Syn.n.**

Antennae 1.5 times length of forewing. In forewing, crossveins Cul-Cu2 and M3+4-Cu1 touching. In hindwing veins M and Cu1 running parallel; fork 1 absent. Spur formula 244. This species is easily distinguished from all others in the genus by the loss of the hook formation on the tenth tergum. TIAN & LI (1987) transferred *Hydropsychodes chinensis* MARTYNOV (1930) to *Potamyia* without examining the type and proposed a replacement name because of the resultant homonymy with *Potamyia chinensis* (ULMER, 1915). We have examined the holotype of *H. chinensis* MARTYNOV 1930 (in BMNH), and it clearly belongs in *Cheumatopsyche*.

***Potamyia chinensis* (ULMER) (Figs 21, 22)**

*Hydropsyche chinensis* ULMER 1915: 47-48. Syntypes ♂ ♀, China: Peking and Honanfu, 1913 (Schoede, Müller) (MNHU, not examined).

*Cheumatopsyche chinensis* (ULMER); MARTYNOV 1934: 283.

*Hydropsyche echigoensis* TSUDA 1949: 21-22. Syntypes ♂ ♀, Japan: Niigata Prov., 1948 (lost). **Syn.n.**

*Cheumatopsyche tienmuisi* SCHMID 1965: 145. Holotype ♂, China: Prov. Chekiang, West Tien-mu-shan, 7 August 1932 (Höne) (MAK, examined). **Syn.n.**

*Potamyia chinensis* (ULMER); TIAN & LI 1987: 128.

**New records:** 6 ♂♂, Vietnam. Moc Chau, 26 October 1986, at light (Oláh) (Fig. 22). 1 ♂: Vietnam, Hoabinh toward Dabac, 21 October 1986, at light (Oláh); 1 ♂: Vietnam, Hoabinh Hotel, 23 October 1986, at light (Oláh); 7 ♂♂: Vietnam, Bac Thai Province, Quang Chu, 24-25 May 1987, at light (Oláh).

Antennae 1.5 times length of forewing. In forewing crossveins Cu1-Cu2 and M3+4-Cu1 touching. In hindwing veins M and Cu1 almost touching; fork 1 present. Spur formula 144. This widely distributed species is found from South China and Japan as far north as Amur (MARTYNOV 1934). On Vietnamese specimens the ninth segment is longer, especially ventrally, the tenth tergum is not compressed midway, the dorsum of the phallosome is concave, and the endothecal process is larger, covering the entire end. Although the types of *echigoensis* TSUDA are lost (Tanida, in litt.) it is clear from the original description, and from an examination of Japanese specimens, that it is a synonym of *chinensis*, as this is the only species known from Japan.

***Potamyia dentifera* (ULMER) comb. n. (Fig. 23)**

*Hydropsyche dentifera* ULMER 1930: 439-440. Holotype ♂: Java: Nongkodjadjar, January 1911 (ZMH, examined).

*Synatopsyche dentifera* (ULMER), ULMER 1951: 251.

Antennal length unknown. In forewing crossveins Cul-Cu2 and M3+4-Cul touching. In hindwing veins M and Cu1 almost touching, fork 1 present. Spur formula 044. This species is close to *P. chinensis*, but is characterised by the down-curved setose tip of the tenth tergum and the broader ninth segment. The apical segment of the clasper is not broadened distally.

***Potamyia dryope* MALICKY & THANI (Fig. 24)**

*Potamyia dryope* MALICKY & THANI, MALICKY et al. 2000a: 30. Holotype ♂: Thailand, Krabi, Kao Phanom Bencha NP, 8°13'N, 98°58' E, 100m, 17 October 1999 (Thani).

**New Records:** 5♂♂: Malaysia, Pahang, Genting Tea Estate, 2000 ft, 22-31 October 1981, at light (Tuck) (Fig. 24).

***Potamyia pallidipennis* (MARTYNOV) comb. n. (Fig. 25)**

*Hydropsyche pallidipennis* (MARTYNOV) 1935: 174-175. Holotype ♂: India, Kumaon Hills, Katarmal, 4500 ft, Almora district U.P. 29 May 1930 (H.S. Pruthi).

***Potamyia periboia* MALICKY & CHANTARAMONGKOL (Fig. 26)**

*Potamyia periboia* MALICKY & CHANTARAMONGKOL, MALICKY 1997: 1037, 1053. Holotype ♂: Thailand, Pai, 600m, 30-31 March 1997. (Stengel).

**The *P. trenhona*-group**

Pale coloured, small-sized species. Ninth abdominal segment truncate anterodorsally producing a reduced dorsum, rounded anteriorly or rather straight; apical lobe on posterolateral margin almost absent. Basal segment of clasper slightly bent or geniculate. Tenth tergum produced into upward or backward curving hooked formations with very broad bases. Setose warts situated apically. Ventral subapical keel on phallosome long or well developed. The species *P. arachne*, *P. chaos*, *P. daphne*, *P. hoenei*, *P. jinhongensis*, *P. phaidra*, *P. siveci*, *P. trenhona*, and *P. yunnanica* comprise this group, which is known from south China, Vietnam, Thailand, Sumatra, Myanmar and India.

***Potamyia arachne* MALICKY (Fig. 27)**

*Potamyia arachne* MALICKY 1998: 20. Holotype ♂: Myanmar, Mandalay Division, Ayeyarwady (= Irrawaddy), 7 February 1998 (Heiss).

**New Records:** India, Bhubaneswar, Dhauri, 20-28 February 1987, 2♂♂ 1♀ light (J. Oláh) (Fig. 27).

***Potamyia chaos* MALICKY & THANI (Fig. 28)**

*Potamyia chaos* MALICKY & THANI, MALICKY et al. 2000: 864, 871. Holotype ♂: Thailand, Heawloam, 9°44'N, 98°40' E, 140m, 5 April 1998 (Thani).

***Potamyia daphne* MALICKY (Figs 29, 30)**

*Potamyia daphne* MALICKY 1998: 20. Holotype ♂: India, Kerala, Kallar-Tal, 1-9 May 1997 (Dembický & Pacholátko).

**New Records:** India, Tamil Nadu, Mudumalai, 1000m, 19 March 1980. 1♂ (Topal). India, Karnataka, Shimoga district, Jog Falls, 500m, 2 March 1980. 1♂ (Topal) (Fig. 30).

***Potamyia hoenei* (SCHMID) comb. n. (Fig. 31)**

*Cheumatopsyche hoenei* SCHMID 1965: 142. Holotype ♂: China: N. Yunnan Prov., Li Kiang, 5 June 1934 (Höne) (MAK, examined).

Antennal length unknown. In forewing crossveins Cu1-Cu2 and M3+4-Cu1 touching. In

hindwing veins M and Cu1 almost touching; fork 1 present. Spur formula 244. This species is close to *P. trenhona* but differs in the form of the hook formation and the phallotheca.

***Potamyia jinhongensis* LI & TIAN (Fig. 32)**

*Potamyia jinhongensis* LI & TIAN 1996: 136, 137, 185. Holotype ♂: China, Yunnan, Jin-hong, 19 August 1983. (Tian Lixin).

***Potamyia phaidra* MALICKY & CHANTARAMONGKOL (Figs 33, 34)**

*Potamyia phaidra* MALICKY & CHANTARAMONGKOL, MALICKY 1997: 1037, 1053. Holotype ♂: Thailand, Pai, 600m, 30-31 March 1997 (Stengel).

N e w r e c o r d : Vietnam, Lamdong, Baoloc, Loc chau, 24 October 1988, at light (Oláh) (Fig. 34).

***Potamyia siveci* MALICKY (Fig. 35)**

*Potamyia siveci* MALICKY 1997: 1038, 1054. Holotype ♂: Sumatra, Dolok Merangir, 20 June -17 July 1971 (Diehl).

***Potamyia trenhona* OLÁH & BARNARD nov.spec. (Fig. 36)**

Male (in alcohol). General colour light fulvous. Antennae 11 mm, slightly less than twice length of forewing. Spur formula 144, single spur on fore-tibia small. Tarsal claws asymmetrical, covered with bristles. Forewing 6.3 mm. In forewing, crossveins M3+4-Cu1 and Cu1-Cu2 meeting in line; Cu2 and A joining well before wing margin; crossveins Sc-R1 and R1+R2+3 absent; pterostigmal area enlarged. In hindwing stem of M plus proximal part of M3+4 almost touching and running parallel with Cu1; fork 1 present; Sc and R1 joining before crossvein R2+3-R4.

Male genitalia. Ninth abdominal segment annular, anteriorly straight except for dorsal corner sharply truncate; dorsum narrowing; apical lobe on posterolateral margin little developed. Tenth tergum not elongated; subpentagonal in lateral view; distal setose surface (preanal appendages) simple, upcurved; hook formation very stout, angulate, with small pointed recurving tips. Clasper slender, almost parallel-sided, slightly broadened caudally in lateral view but very bulbous in ventral view, slightly geniculate mid-way; apical segment blunt with small pointed mesal projection. Phallotheca with elongated and enlarged base, dorsum distally lowered, together with the broadened ventral subapical keel resulting in geniculate configuration. Phallotremal sclerite small, tapering to narrow apex, sclerous band of the endophallus larger, heavily sclerotized forming smaller dorsal and more developed ventral branch. Lobules of ventral endothecal lobe circular, located on ventral tip of keel. Endothecal process elongated.

This species is similar to *P. phaidra* but the spinelike process on the hook formation is small and the caudally situated setose surface much simpler; the stem of the phallic apparatus is not geniculate in *P. phaidra*. The species is named after the upper position of the setose surface compared to the tip of the spinelike process on the hook formation, from 'trenhon' meaning 'upper' in Vietnamese.

H o l o t y p e ♂: Vietnam, Lamdong, Baoloc, Loc Chau, 24 October 1988, at light (Oláh) (J. Oláh collection). P a r a t y p e s 8♂♂: same data as holotype (J. Oláh collection); 1♂: N. Vietnam, Tam Dao, 14 July 1994 (MNHU).

***Potamyia yunnanica* (SCHMID) (Fig. 37)**

*Cheumatopsyche yunnanica* SCHMID 1959: 325. Holotype ♂: China: N. Yunnan Prov., Li Kiang, 16 May 1934 (Höne) (MNHU, examined).

*Potamyia yunnanica* (SCHMID); TIAN & LI 1987: 128.

Antennal length unknown. In forewing crossveins Cu1-Cu2 and M3+4-Cu1 touching. In hindwing veins M and Cu1 almost touching; fork 1 present. Spur formula 144. This species is closest to *P. phaidra*, but the apical lobe on the posterolateral margin is more developed, the ventral keel on the phallosome is short, and the endothecal process much larger and semicircular. The dorsum of the phallosome is concave, but is convex in *P. phaidra*.

**The *P. czezanovskii*-group**

This group contains eight species sharing the following characters. Ninth abdominal segment narrow, not strongly rounded, apical lobe on posterolateral margin absent or not well developed with narrow base. Basal segment of clasper straight or geniculate. Tenth tergum developed with very characteristic upwardly directed hook formation; hook at least twice as long as wide, base narrow, situated at ventroapical corner (except in *P. euadne*). Setose warts in apical position, enlarged and fused, forming part of shape of apical plate. The species are found in Turkestan, Siberia, China (including the northern territories) as well as in Korea, Thailand, Malaysia, Vietnam, Indonesia and Sri Lanka. The species *P. alleni*, *P. bicornis*, *P. czezanovskii*, *P. euadne*, *P. flavata*, *P. horvati*, *P. nikalandugola* and *P. peitho* comprise this group.

***Potamyia alleni* MALICKY & CHANTARAMONGKOL (Fig. 38)**

*Potamyia alleni* MALICKY & CHANTARAMONGKOL, MALICKY 1997: 1034, 1054. Holotype ♂: Thailand, Doi Inthanon, 1200m, 10 September 1988 (Allen).

***Potamyia bicornis* LI & TIAN (Fig. 39)**

*Potamyia bicornis* LI & TIAN 1996: 137, 138, 185-6. Holotype ♂: China, Tong-chong, 22 May 1983 (Tian Li-xin).

***Potamyia czezanovskii* (MARTYNOV) (Fig. 40)**

*Hydropsyche czezanovskii* MARTYNOV 1910: 393-396. Syntypes ♂ ♀, Siberia, Upper Tunguska, (ZI, not examined).

*Cheumatopsyche czezanovskii* (MARTYNOV); MARTYNOV 1934: 283, 289.

*Potamyia czezanovskii* (MARTYNOV); SCHMID 1967: 275.

Antennae 1.5 times length of forewing. In forewing crossveins Cu1-Cu2 and M3+4- Cu1 touching. In hindwing veins M and Cu1 almost touching; fork 1 present. Spur formula 044. This species has a characteristic hook formation and very broad tenth tergum. It is closest to *P. flavata* but the clasper is not geniculate ventrally; the ventral keel on the phallosome is reduced; and the tenth tergum is broadened laterally.

The larva of this species was described (as *Cheumatopsyche*) by LEPNEVA (1948) and it is widely distributed in the large Siberian rivers Ob, Yenisey, Amur. It was recorded from Korea by BOTOSANEANU (1970).



***Potamyia euadae* MALICKY & SAENGPRADAB (Fig. 41)**

*Potamyia euadae* MALICKY & SAENGPRADAB, MALICKY et al. 2001: 12. Holotype ♂: Thailand, Prov. Mae Hong Son, Ban Huai Hia, 1100m, 19°39'N, 98°14'E, 15 April 2000 (H. Malicky).

New record: 1♂ Vietnam, Hanoi, West Lake, 8 October 1986, at light (Oláh) (Fig. 41).

***Potamyia flavata* (BANKS) (Fig. 42)**

*Hydropsyche flavata* BANKS 1934: 569. Syntype ♂ Malaysia: Kuala Lumpur (BMNH, examined).

*Synaptopsyche klakahana* ULMER 1951: 254-255. Holotype ♂, Java: Klakah, x.1928 (Thienemann) (ZMH, examined). Synonymised by MALICKY (1997).

*Potamyia proboscida* LI & TIAN 1996: 136, 137, 185. Holotype ♂, China, Ba-wang-ling, Hainan, 23 May 1983 (Ke Ming-hui) **syn.n.**

New records: 1♂: Vietnam, Moc Chau, 26 October 1986, at light (Oláh), 1♂: Hanoi, Red River, 28 October 1986, from below embankment stones on the shoreline (Oláh), 1♂: Hoabinh, 12 km to Dabac, 30 January 1986, at light (Oláh). 1♂: Lombok, Narmada, 20 March 1927 (Rensch).

Antennae 1.5 times length of forewing. Spur formula 044. Tarsal claws asymmetrical, one covered with bristles. Forewing 7 mm. In forewing, crossveins M3+4-Cu1 and Cu1-Cu2 meeting in line; Cu2 and A joining before wing margin; crossveins Sc-R1 and R1-R2+3 absent, pale pterostigmal area enlarged. In hindwing stem of M plus proximal portion of M3+4 touching and running parallel with Cu1; fork 1 present; Sc and R1 joining well before crossvein R2+3-R4.

Male genitalia. Ninth abdominal segment annular, anteriorly rounded, narrowing both dorsally and ventrally; apical lobe on posterolateral margin well developed, triangular. Tenth tergum very short, quadrangular; hook formation with thin basal portion. Clasper slender, geniculate, narrowing subbasally; apical segment with fine denticulate ending. Phallosome with elongated and enlarged base, dorsum with central and subapical undulation, distal apex strongly upcurving, ventral subapical keel short and broad. Phallosomal sclerite small, horizontal and situated dorsally, following upcurving endothecal process; sclerous band of endophallus well developed. Lobules of ventral endothecal process small, ventral. Endothecal process short, its dorsum unusually straight.

*P. flavata* is recognised by the genitalia characters given above, but it is a somewhat variable species with a wide distribution.

***Potamyia horvati* MALICKY & CHANTARAMONGKOL (Fig. 43)**

*Potamyia horvati* MALICKY & CHANTARAMONGKOL, MALICKY 1997: 1035-1036, 1055. Holotype ♂: Thailand, Doi Inthanon, 10 September 1988 (Allen).

***Potamyia nikalandugola* (SCHMID) comb. n. (Fig. 44)**

*Synaptopsyche nikalandugola* SCHMID 1958: 114-115. Holotype ♂: Sri Lanka: Deniyaya, 5 February 1954 (Schmid) (not examined).

Antennae 1.5 times length of forewing. In forewing crossveins Cu1-Cu2 and M3+4-Cu1 touching. In hindwing veins M and Cu1 almost touching; fork 1 present. Spur formula 044. This species is closest to *P. czekanovskii*, having the same upwardly directed hook formation, but the hooks are longer and the tenth tergum narrow with no lateral bulges. The ventral keel on the phallosome is well developed. Although no type material was examined, this species is easily recognised from the description, and is the only species in Sri Lanka. Dr O.S. Flint (NMNH) kindly sent us specimens for examination.

***Potamyia peitho* MALICKY & CHANTARAMONGKOL (Fig. 45)**

*Potamyia peitho* MALICKY & CHANTARAMONGKOL, MALICKY 1997: 1036, 1055. Holotype ♂: Thailand, Doi Puka, 1200m, 5 October 1991 (Schwendinger).

**Zusammenfassung**

Taxonomie, Ökologie und Verbreitung der Arten der Gattung *Potamyia* BANKS werden revidiert. Die bisher bekannte Verbreitung der Gattung in der Orientalischen Region und in Nordamerika erweitert sich beträchtlich durch die Entdeckung von sechs Arten in Madagaskar. Von den nun bekannten 42 Arten werden acht als neu beschrieben: *P. ifanadiana* nov.spec., *P. tofina* nov.spec., *P. andoba* nov.spec., *P. karafa* nov.spec., *P. andria* nov.spec., *P. korasha* nov.spec. (alle aus Madagaskar), *P. nuonga* nov.spec., *P. trenhona* nov.spec. (beide aus Vietnam). Fünf Arten werden neu in die Gattung transferiert: *P. chekiangensis* (SCHMID) (aus *Cheumatopsyche*), *P. dentifera* (ULMER) (aus *Synaptopsyche*), *P. pallidipennis* (MARTYNOV) (aus *Hydropsyche*), *P. hoenei* (SCHMID) (aus *Cheumatopsyche*), *P. nikalandugola* (SCHMID) (aus *Synaptopsyche*). Fünf neue Synonymien im Artrang werden etabliert: *P. trilobata* ULMER 1932 = *P. straminea* MCLACHLAN 1875; *C. parva* TIAN & LI 1987 = *P. chekiangensis* SCHMID 1965; *P. echigoensis* TSUDA 1949 = *P. tienmuisica* SCHMID 1965 = *P. chinensis* ULMER 1915.

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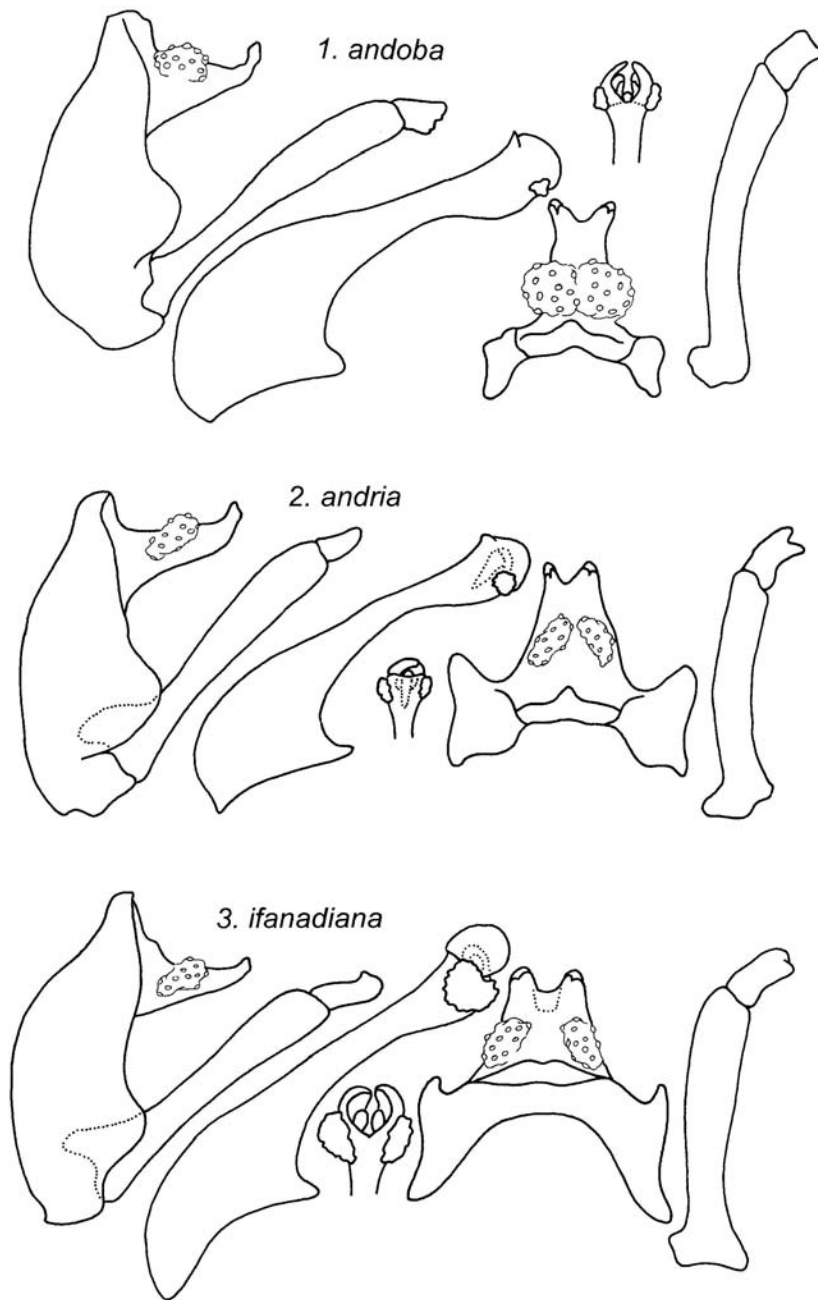
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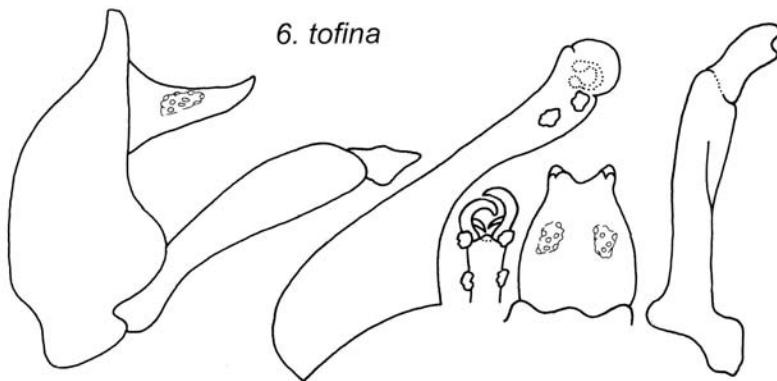
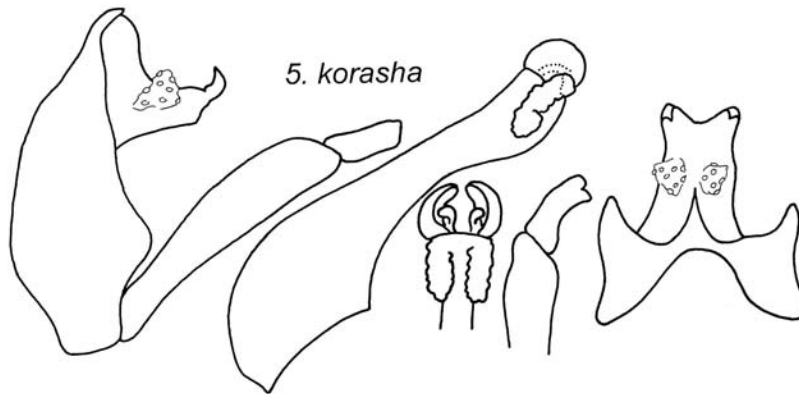
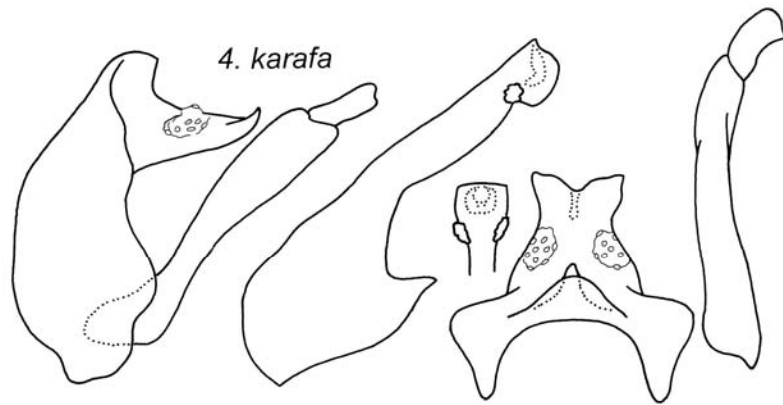
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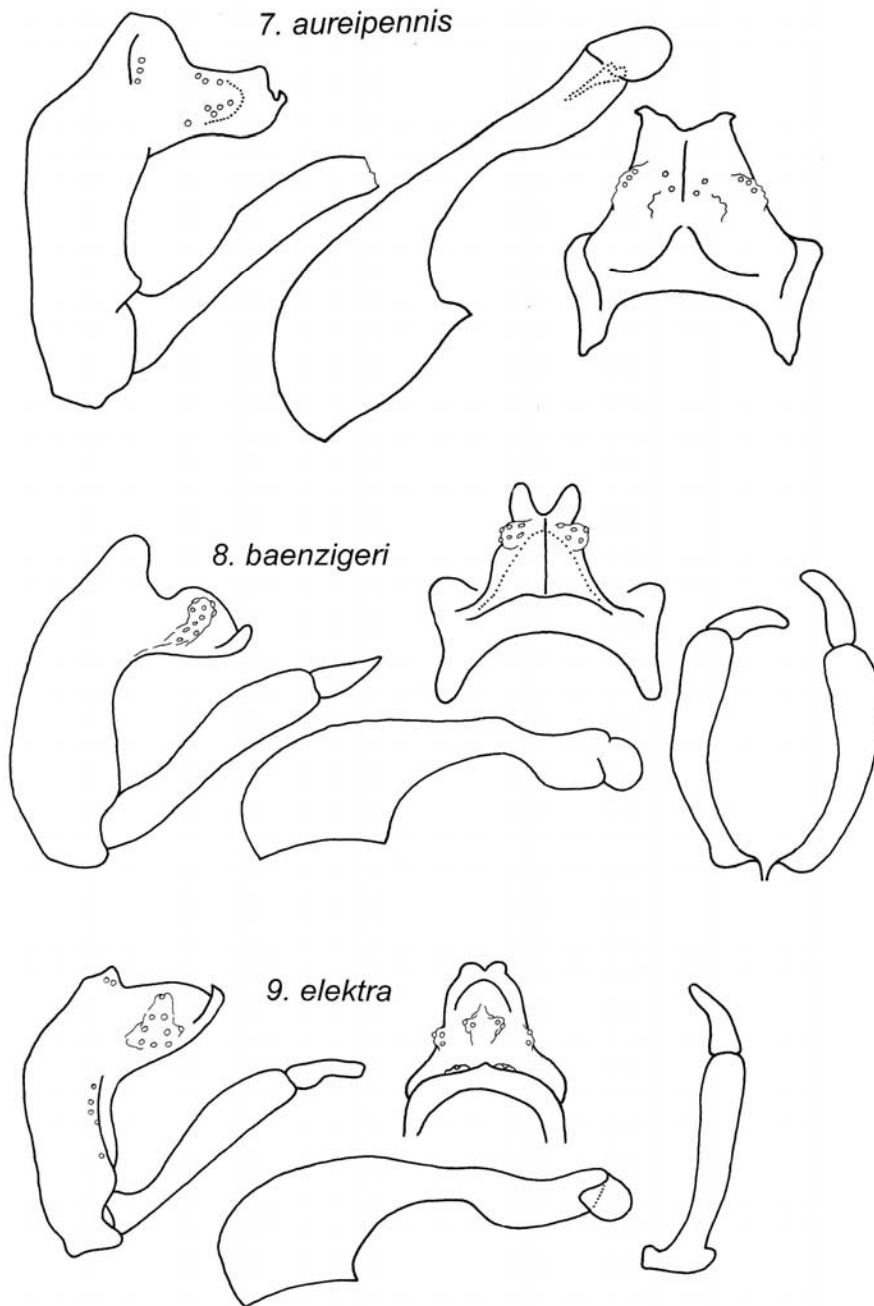
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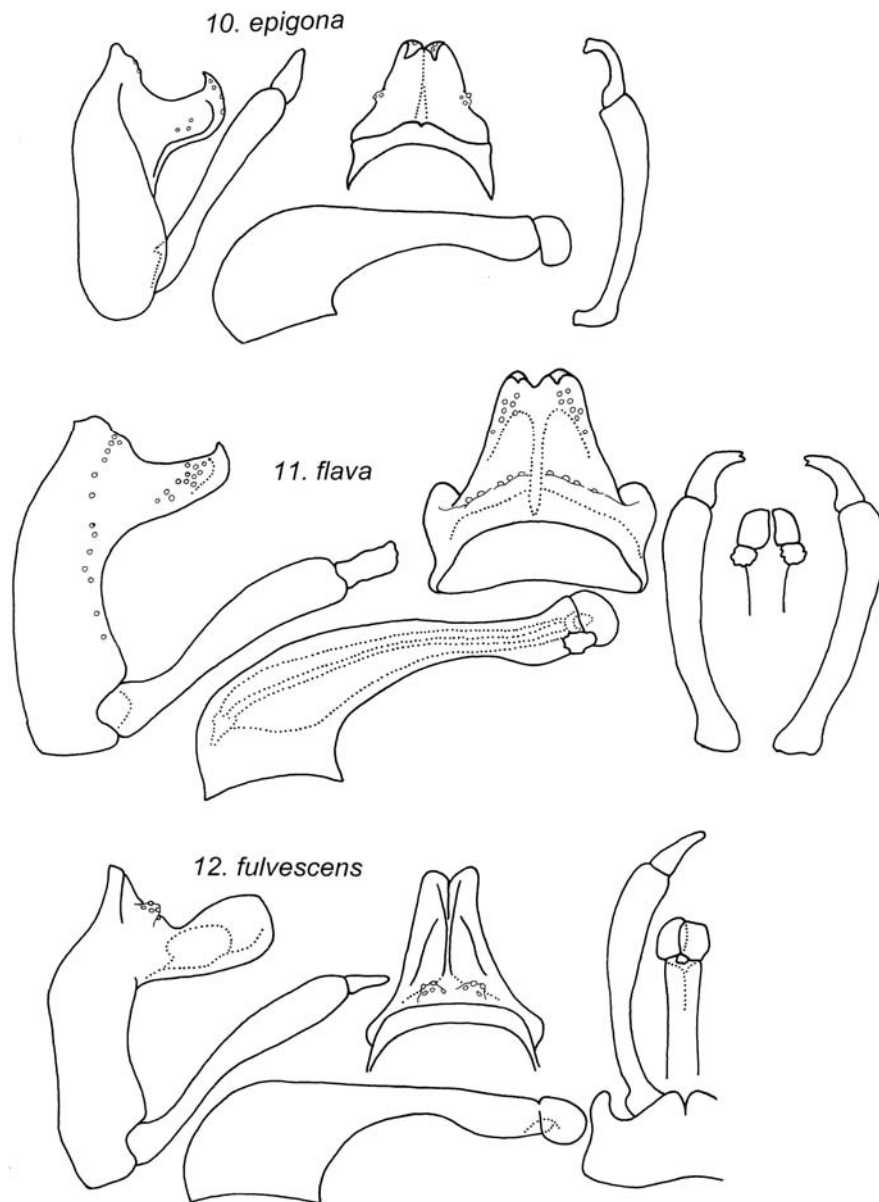
**Fig. 1:** *Potamyia andoba* nov.spec., **Fig. 2:** *Potamyia andria* nov.spec., **Fig. 3:** *Potamyia ifanadiana* nov.spec.



**Fig. 4:** *Potamyia karafa* nov.spec., **Fig. 5:** *Potamyia korasha* nov.spec., **Fig. 6:** *Potamyia tofina* nov.spec.

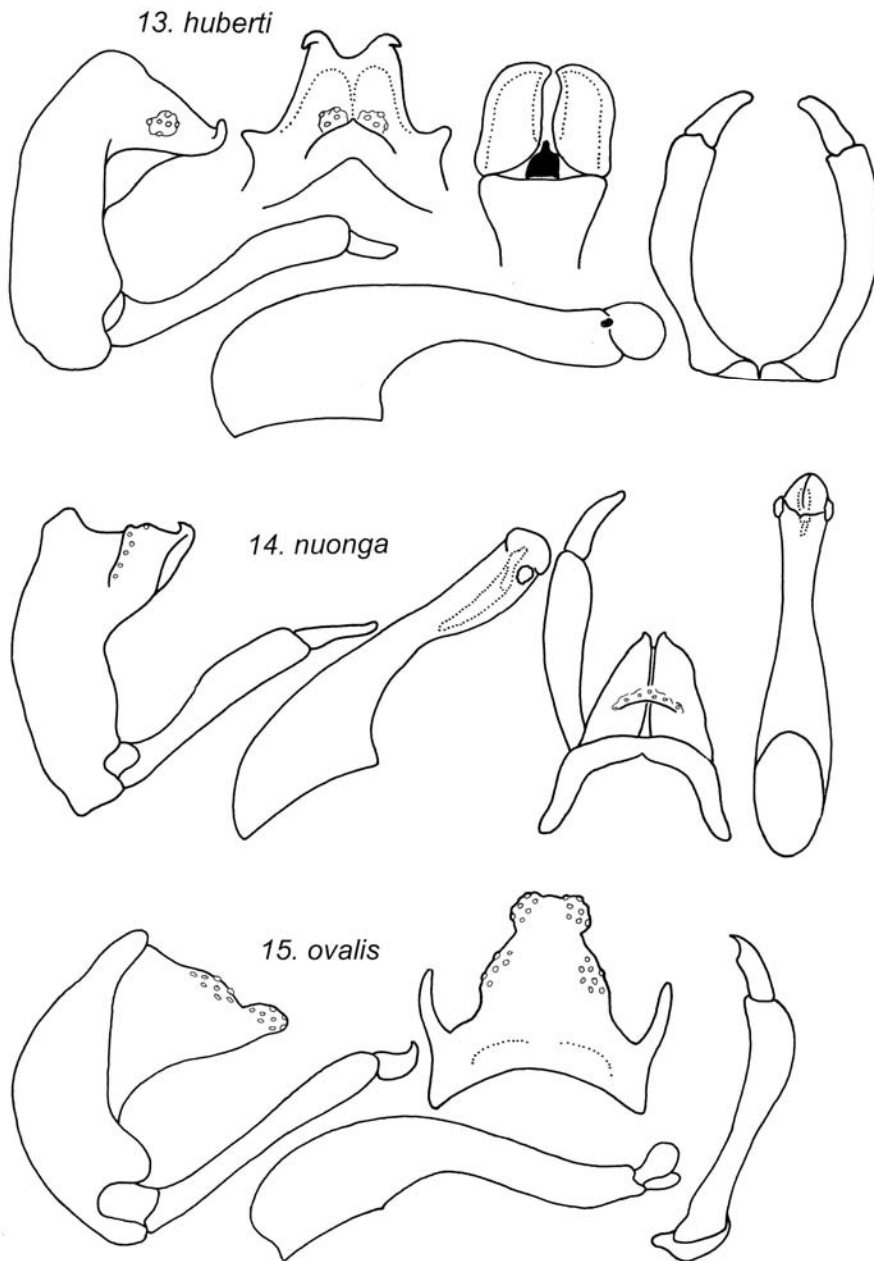


**Fig. 7:** *Potamyia aureipennis*, **Fig. 8:** *Potamyia baenzigeri*, **Fig. 9:** *Potamyia elektra*.

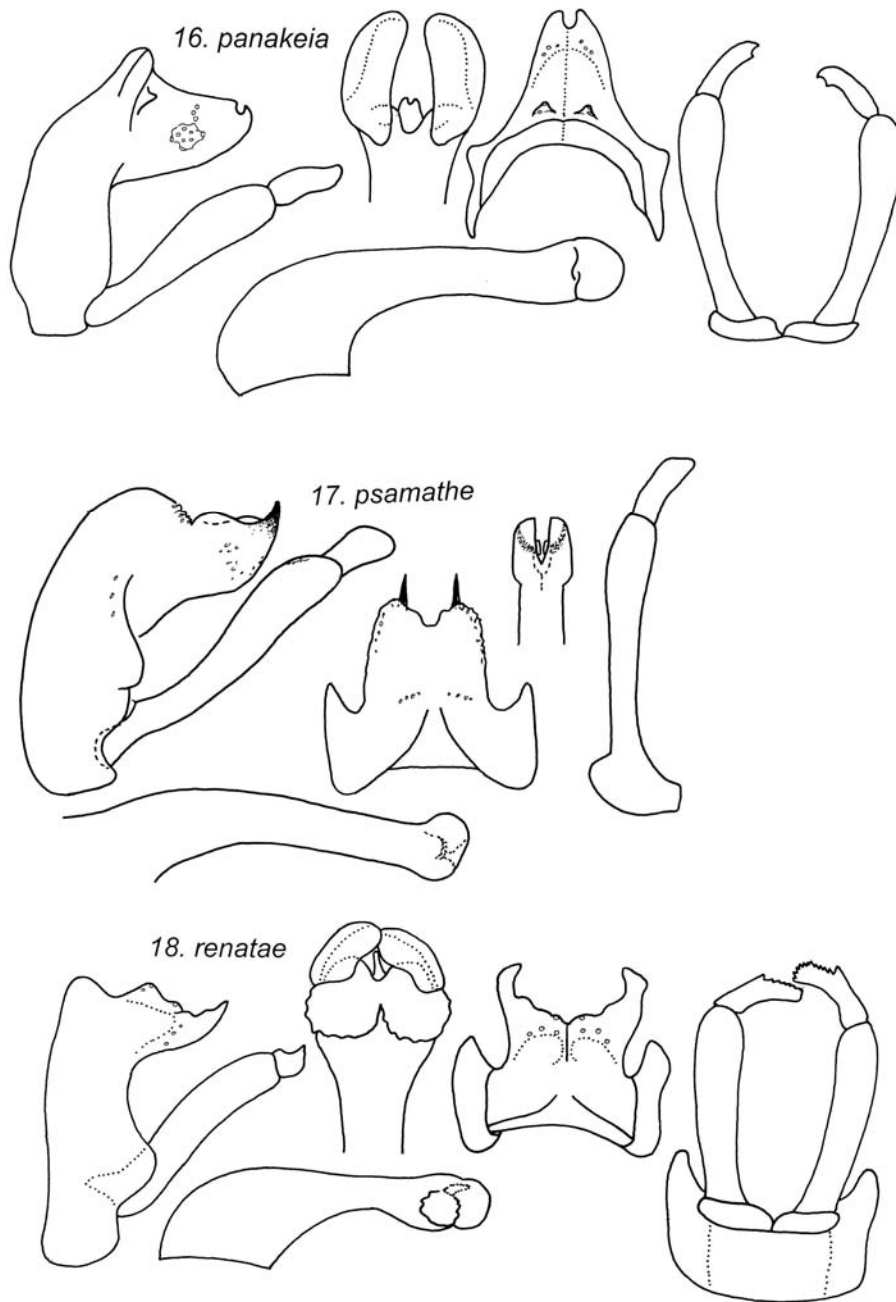


**Fig. 10:** *Potamyia epigona*, **Fig. 11:** *Potamyia flava*, **Fig. 12:** *Potamyia fulvescens*.

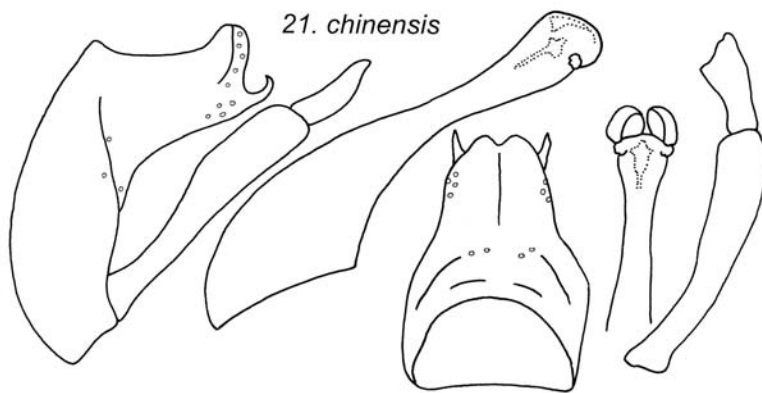
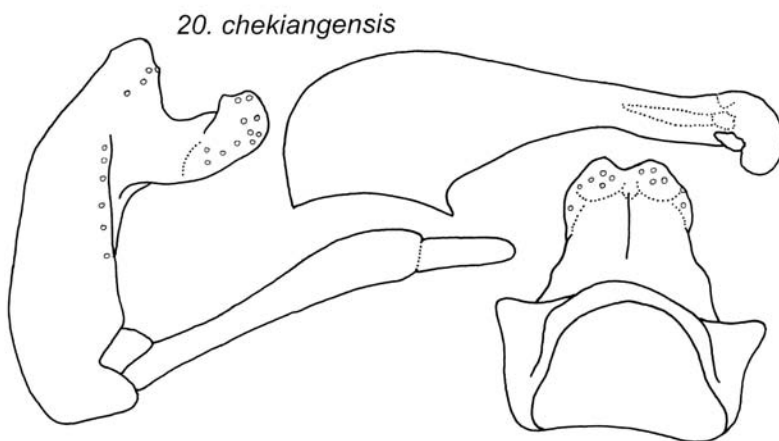
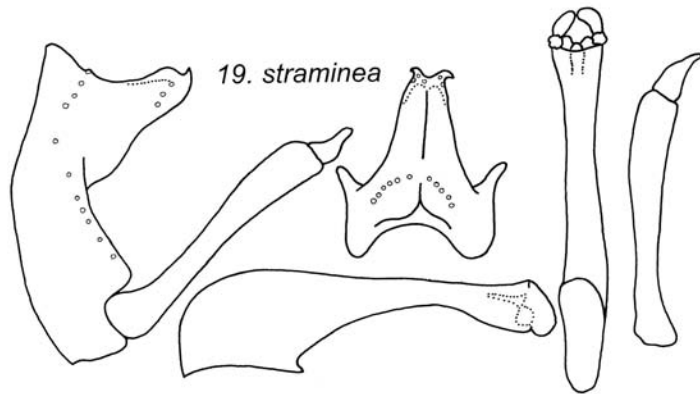




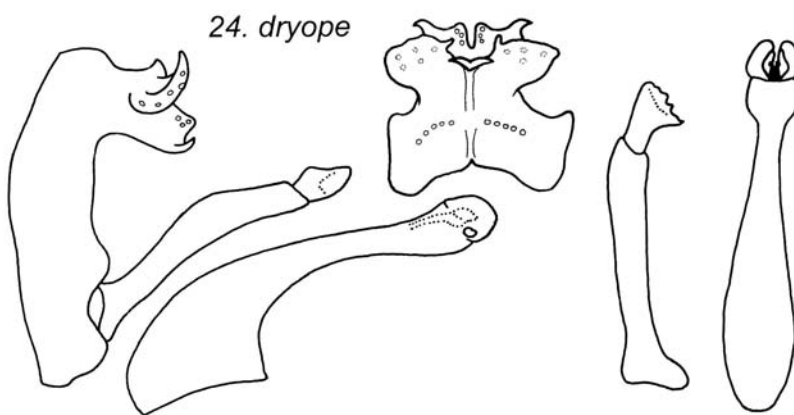
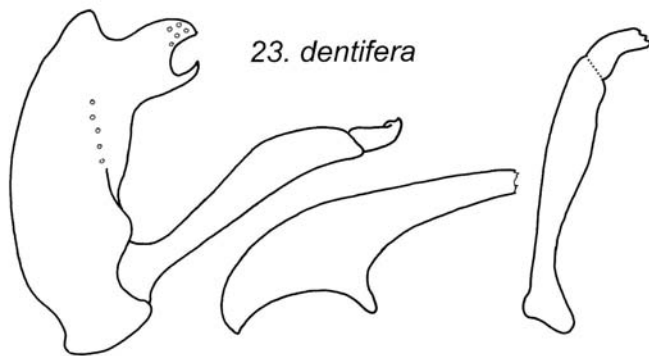
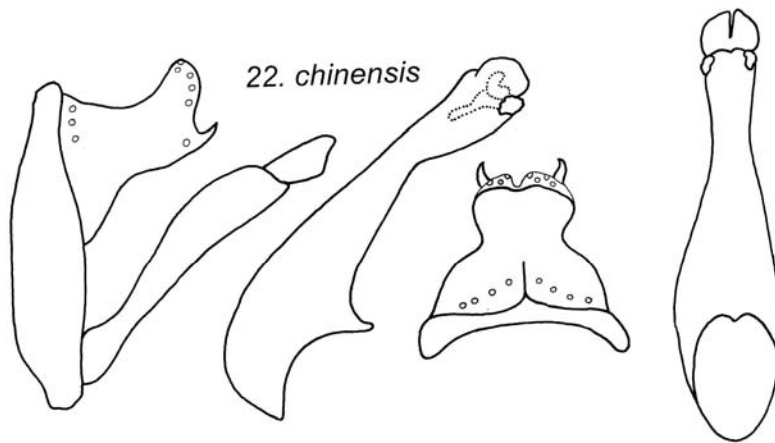
**Fig. 13:** *Potamyia huberti*, **Fig. 14:** *Potamyia nuonga* nov.spec., **Fig. 15:** *Potamyia ovalis*.



**Fig. 16:** *Potamyia panakeia*, **Fig. 17:** *Potamyia psamathe*, **Fig. 18:** *Potamyia renatae*.

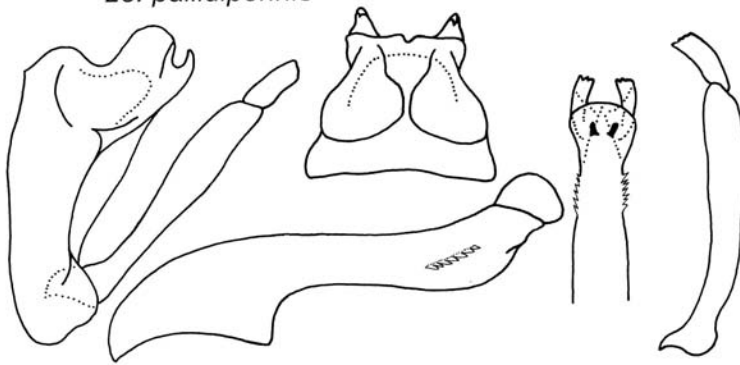


**Fig. 19:** *Potamyia straminea*, **Fig. 20:** *Potamyia chekiangensis*, **Fig. 21:** *Potamyia chinensis*.

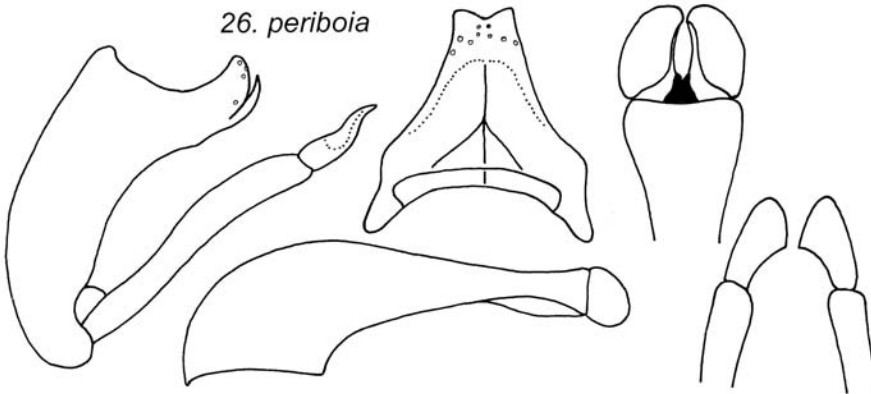


**Fig. 22:** *Potamyia chinensis*, **Fig. 23:** *Potamyia dentifera*, **Fig. 24:** *Potamyia dryope*.

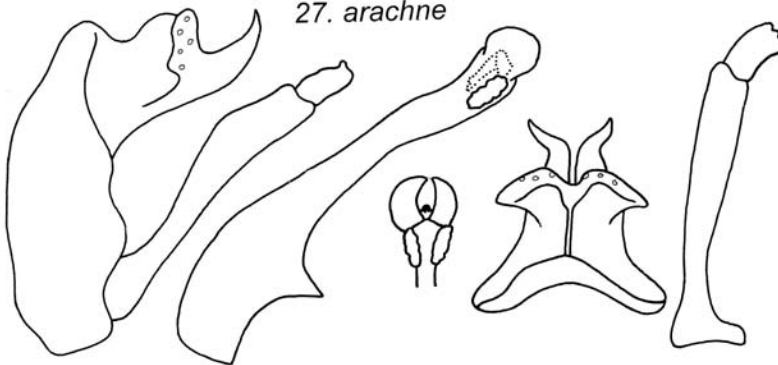
25. *pallidipennis*



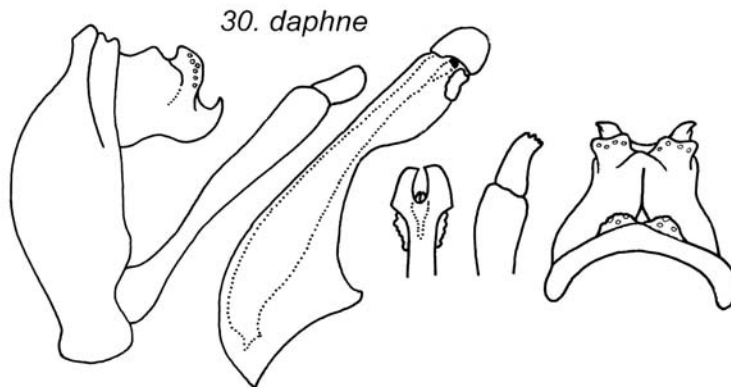
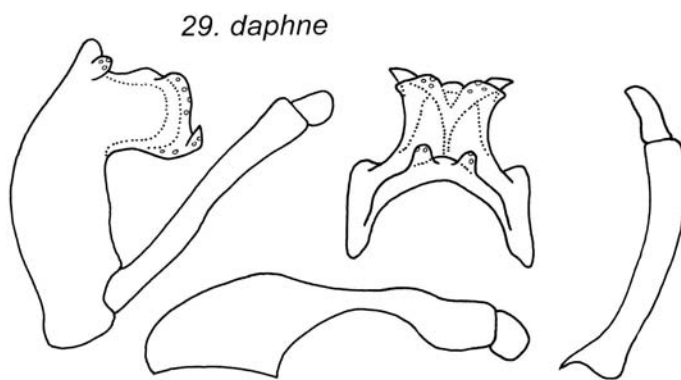
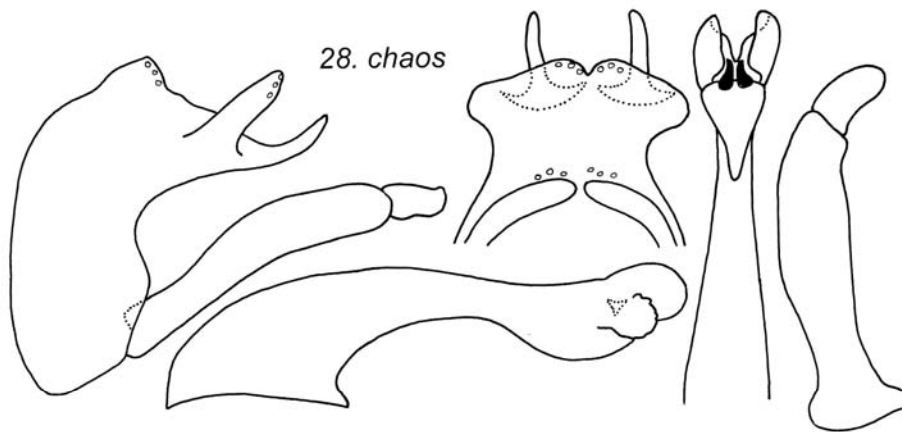
26. *periboia*



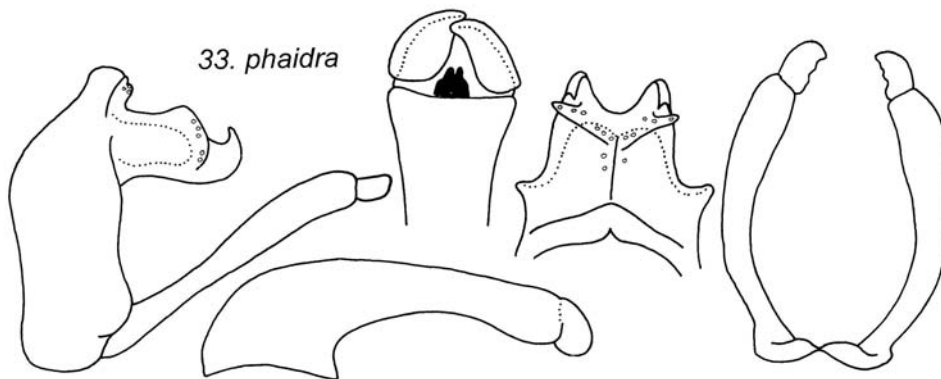
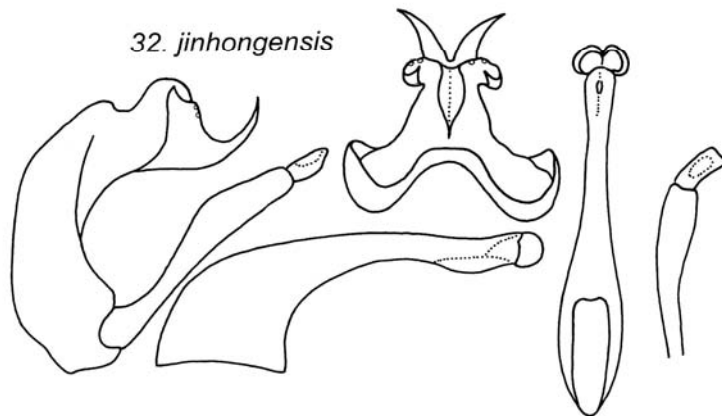
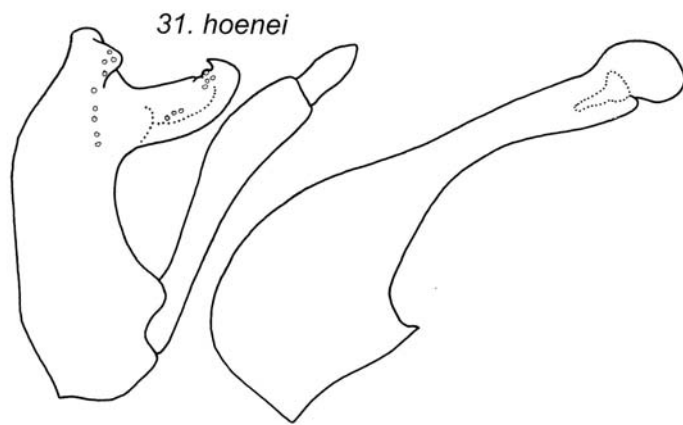
27. *arachne*



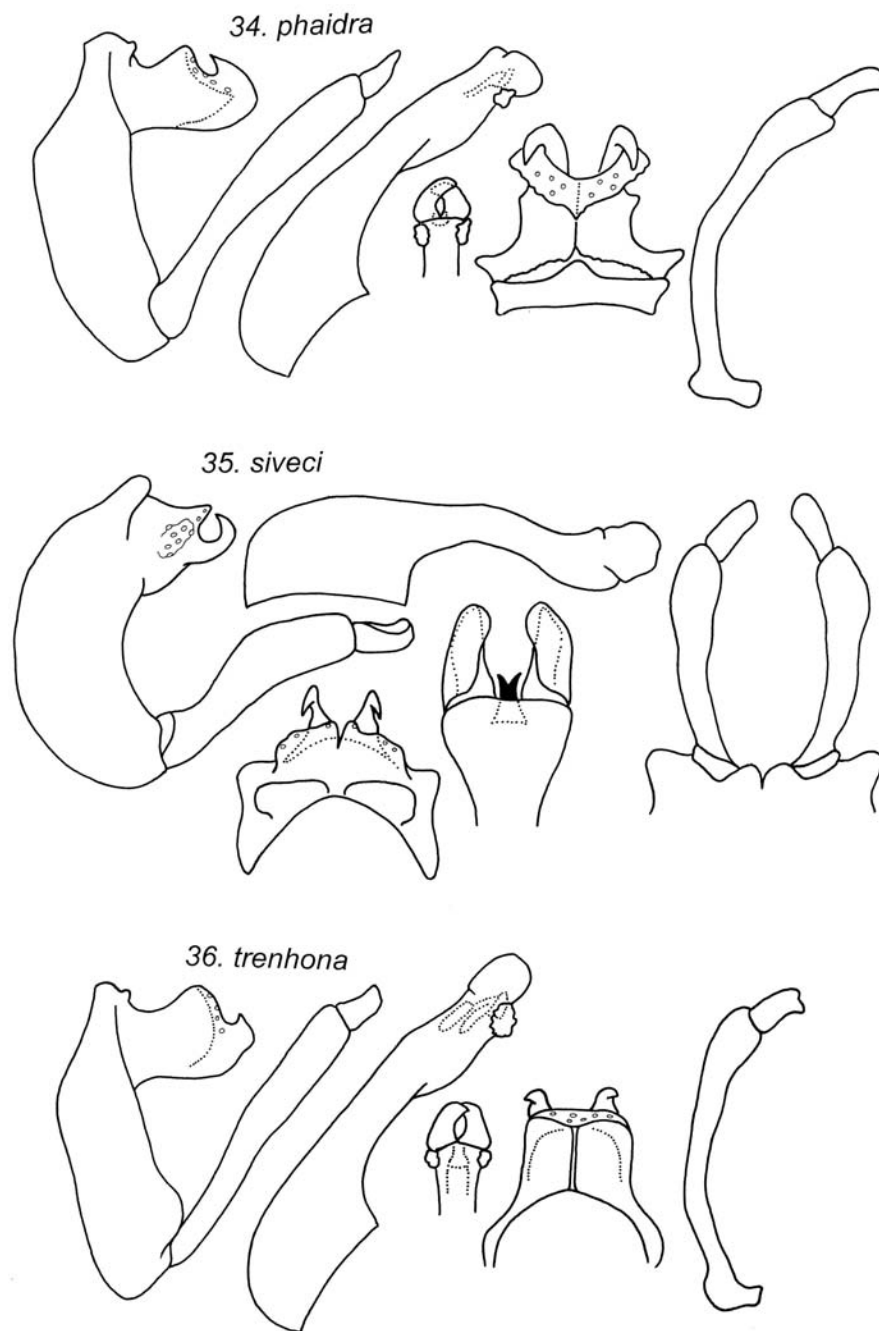
**Fig. 25:** *Potamyia pallidipennis*, **Fig. 26:** *Potamyia periboia*, **Fig. 27:** *Potamyia arachne*.



**Fig. 28:** *Potamyia chaos*, **Figs: 29, 30.** *Potamyia daphne*.

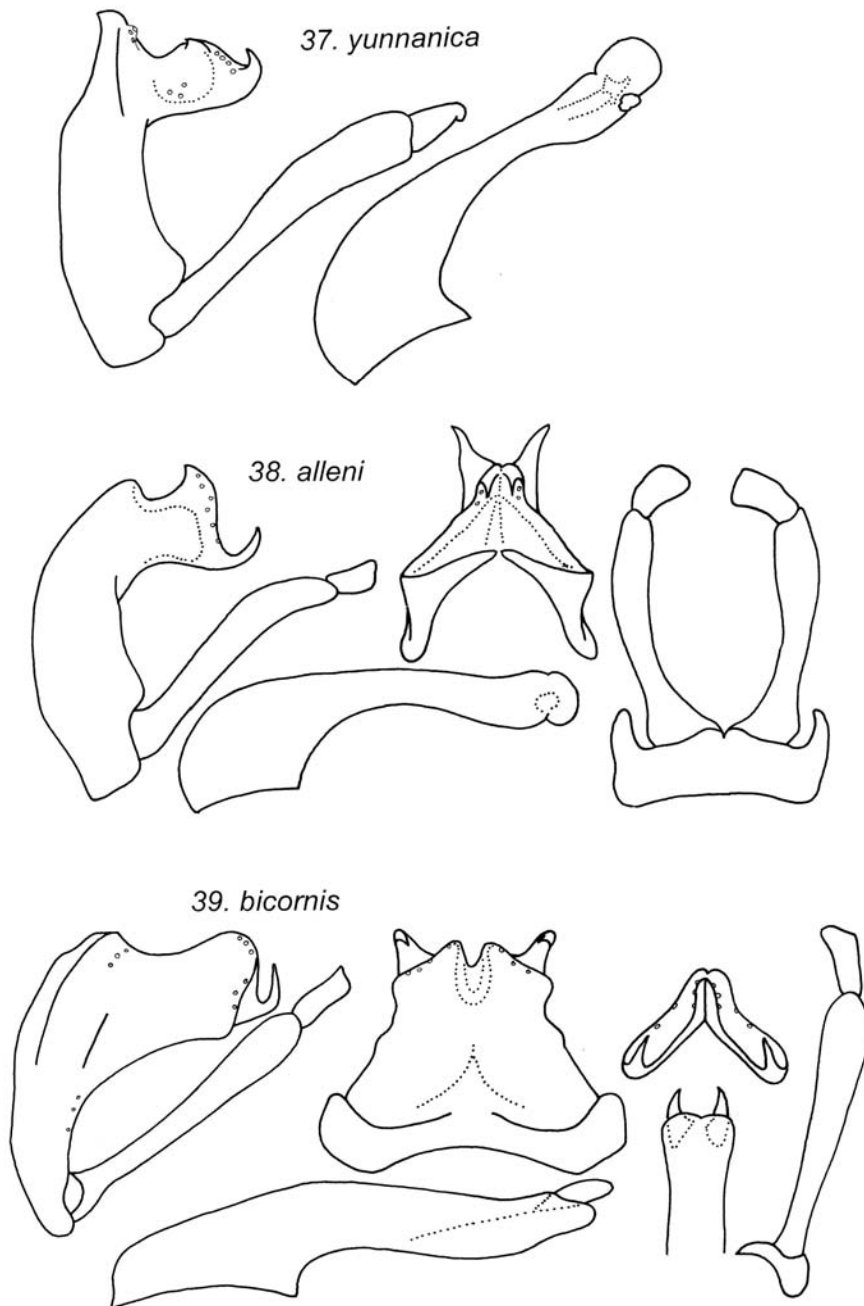


**Fig. 31:** *Potamyia hoenei*, **Fig. 32:** *Potamyia jinhongensis*, **Fig. 33:** *Potamyia phaidra*.

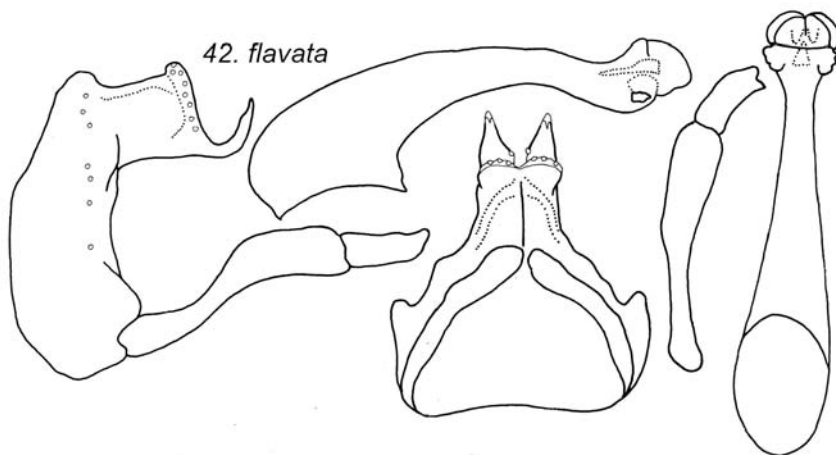
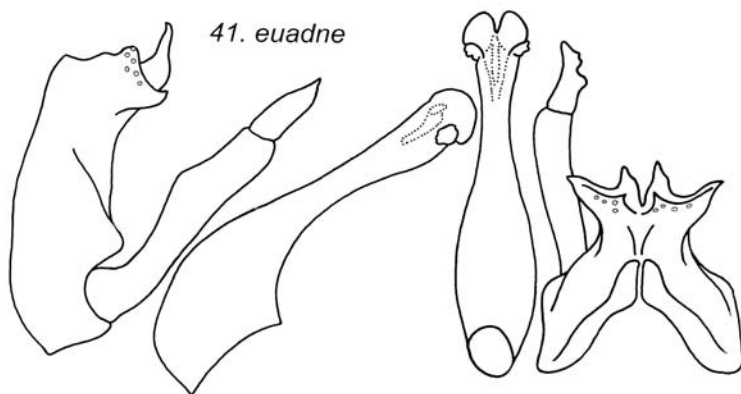


**Fig. 34:** *Potamyia phaidra*, **Fig. 35:** *Potamyia siveci*, **Fig. 36:** *Potamyia trenhona* nov.spec.

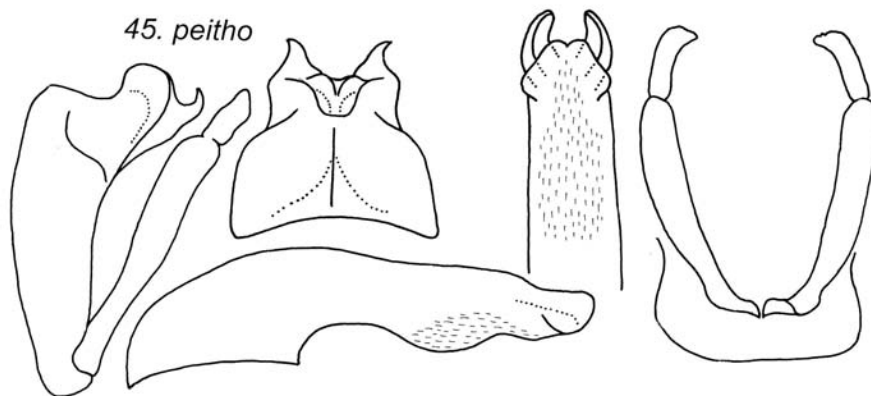
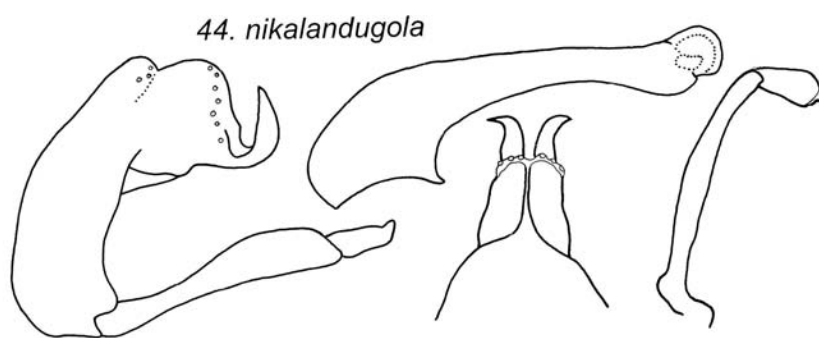
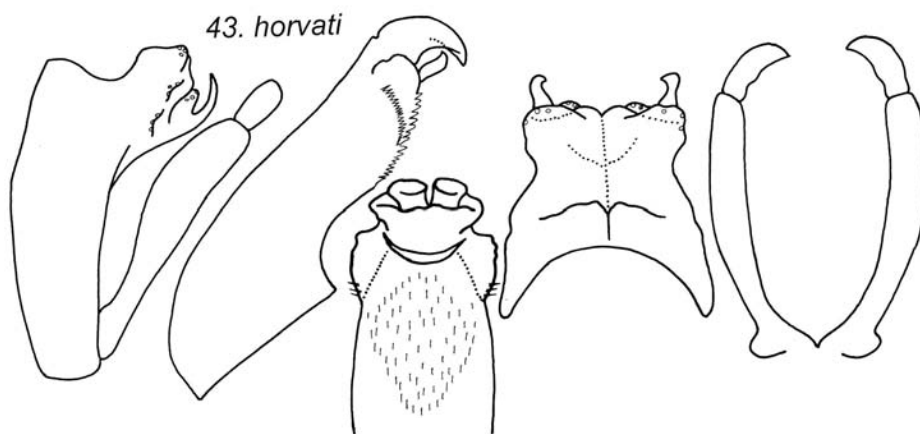




**Fig. 37:** *Potamyia yunnanica*, **Fig. 38:** *Potamyia alleni*, **Fig. 39:** *Potamyia bicornis*.



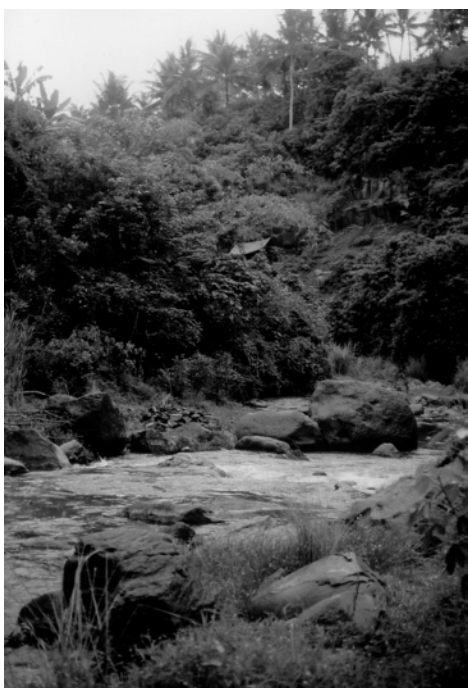
**Fig. 40:** *Potamyia czekanovskii*, **Fig. 41:** *Potamyia euadne*, **Fig. 42:** *Potamyia flavata*.



**Fig. 43:** *Potamyia horvati*, **Fig. 44:** *Potamyia nikalandugola*, **Fig. 45:** *Potamyia peitho*.



**Fig. 46:** Huai Pang Paek stream near Pai, Thailand: type locality of *Potamyia epigona*.



**Fig. 47:** Petanu stream near Tegenungan Falls, Bali, Indonesia: biotope of *Potamyia flavata*.



**Fig. 48:** Nam Mae Mon stream at Jaeson National Park, Thailand: type locality of *Potamyia baenzigeri*.



**Fig. 49:** Mae Klang river at Ban Sob Aeb, Doi Inthanon National Park, Thailand: type locality of *Potamyia panakeia*.



**Fig. 50:** Awu river near Tuwel, Central Jawa, Indonesia: biotope of *Potamyia aureipennis*.



**Fig. 51:** Dong Nai river at Nam Cat Tien, Vietnam: type locality of *Potamyia huberti*.





**Fig. 52:** Mississippi river at Minneapolis, Minnesota, USA: biotope of *Potamyia flava*.



**Fig. 53:** Narayani Ganga at Chitwan National Park, Nepal: type locality of *Potamyia renatae*.

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Autor(en)/Author(s): Olah Janos, Barnard Peter C., Malicky Hans

Artikel/Article: [A revision of the lotic genus Potamyia BANKS 1900 \(Trichoptera: Hydropsychidae\) with the description of eight new species 739-777](#)