

Apionidae from North and Central America. Part 3. A New Genus in the Tribe Aplemonini Kissinger from Mexico (Coleoptera)

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Abstract

A new genus, *Femtapion* (type species *F. andersoni* Kissinger, new species from central Mexico), is described in the tribe Aplemonini. Distinguishing features include body minute, globose, glabrous, polished; middle coxae not separated by union of median mesosternum and median metasternum; elytra lack humeri but (apparently) functional flying wings present; endophallus with coiled flagellum. The occurrence of a modified endophallic flagellum is unique in the New World Apioninae (with the exception of the Antilles). *Perapion wickhami* (Kissinger) is recorded from Scotts Bluff, Nebraska. *Apion (Trichapion) memnonmonum* Kissinger from North Carolina shows an unusual disjunct distribution. It is recorded on unopened flower buds of *Amorpha* sp. at 3 mi NE Angeles Oaks, camp Cedar Falls 6000', San Bernardino Co., California in June.

Introduction

This paper continues a taxonomic study of Apionidae from North and Central America begun in Kissinger (1990). Methods, terminology, acknowledgments and symbols for specimen location are given there.

Knowledge of the apionid taxa on all levels is far from complete because numerous new species and other taxa remain to be described. The entire mass of 1500-2000 species needs to be integrated into a system of higher categories. Lack of information makes the interpretation and ranking of groups and characters in Apionidae (and all curculionoids) a difficult matter.

A case in point is the recognition of Aplemonini as a tribe by Kissinger (1968). This tribe is based largely on one unusual character: the 2nd coxal cavities appear to be open because there is a gap

between the posterior median mesosternal process and anterior median metasternal process which are fused to each other in most curculionoids.

That this is an unusual character is evident from the fact that all other apionids and curculionoids have the 2nd coxal cavities closed, something on the order of 50-60000+ species, about 10000 genera, 100+ tribes, and 25-50 subfamilies.

The open 2nd coxal cavity is a "convenient" character to use in a mass of species not known for presenting easy-to-use taxonomic characters; it is not the only character, however. A second "convenient" character is a derived type of endophallic flagellum as exhibited by *Megatracheloides* Lucas, *Rhadinocyba* Faust, *Neocyba* Kissinger, and *Apotapion* Zimmerman.

The idea that the combination of open 2nd coxal cavity and the derived endophallic flagellum is unusual is supported by the distribution of the tribe Aplemonini which can be interpreted as that of a relict group occurring especially on islands, either in Oceania or else on mountains, a kind of ecological island.

Recently, it was discovered that there may be intraspecific variation in the open 2nd coxal cavity. Three specimens of *Circapion circipenne* (Wagner) were examined from Peru (Cajamarca Celedin area, 25May-11June 1936, F. Waytkowski, RSA). Figure 8 indicates that the union of the processes between the 2nd coxae can be complete, as is usually seen in curculionoids; the process is quite narrow. Figure 7 illustrates that a gap may be formed when the posteriorly projecting part of the median mesosternum is directed dorsally instead of making contact with the median anterior part of the metasternum. This is the first record of variation in the structure of the 2nd coxal cavity in the Curculionoidea.

The importance of the open 2nd coxal cavities in the definition of Aplemonini may need to be re-evaluated because *Piezaplemonus* Wanat and *Nanomymyrcyba* Wanat described from the orient show affinities to Piezotrachelini in spite of having open 2nd coxal cavities; also, *Pseudorhinapion* Voss and the *Conapion trapezicolle*-species group in Africa exhibit open 2nd coxal cavities and are clearly members of Piezotrachelini (Wanat, 1990). Among the New World Aplemonini, *Chrysapion tantillum* (Sharp) exhibits characters approaching the Piezotrachelini.

Femtapion described here displays both the open 2nd coxal cavity and a (derived) endophallic flagellum, a character found also in Aplemonini from Oceania. No apionine native to North, Central and South America is known to have an endophallic flagellum except for *Femtapion* (the Antilles are excluded from this statement).

Genus *Femtapion* Kissinger new genus

Middle coxal cavities open (posterior median mesosternal process and anterior median metasternal process separated between middle coxae). Legs of male lack special characters. Minute; nearly glabrous; nearly impunctate. Pronotum conical in form, bisinuate at base. Scutellum visible. Elytra lack humeri; (apparently functional) flight wings present; with 9 fine, shallow striae. Suture between sterna 1 & 2 fine, shallow; sterna not modified in male. Tarsal segment 1 longer than wide. Tarsal claw simple. Endophallus with slender, long, coiled flagellum. Free ring of basal piece fused with tegminal plate; basal plate flat medially. Type species: *Femtapion andersoni* Kissinger. The generic name is based on the Norwegian or Danish word, femten, for fifteen; this is the fifteenth genus assigned to Aplemonini.

Femtapion andersoni Kissinger new species

Type series. *Holotype*. Male. MEXICO: Puebla: 1.2 mi N Xicotepec de Juarez 3500', 17 VI 1983, R. Anderson, Cloud-mixed oak for(est); Measurement 000379 det KISSINGER. (RSA). *Paratypes*. 2 male. MEXICO: Jalisco, Chamela Biol. Sta. RSA, 22 X

1980, A.N. Garcia Aldrete, Measurement 000387,388 det KISSINGER. (CWOB, DGK).

Description. Figures 1-6. Measurement data on table 1. Male. **General aspect:** Body minute, dark castaneous, antenna and legs in part paler. Polished, nearly glabrous, scales setiform, very fine, no more than 2 μ long, very sparse. **Head:** Rostrum short, stout, tapered from insertion of antenna to apex; with fine, sparse punctures; in profile ventral margin nearly straight, dorsal margin curved, with row of 4-7 setae about 5 μ long in front of antennal insertion near ventral margin; dorsal margin of scrobe strongly, evenly descending to ventral margin of head; subcephalic ridges high, extending past posterior margin of eye, transverse posterior ridge low. **Prothorax:** Nearly impunctate, pronotum lacking basal lateral expansion, conical in shape, not constricted apically, suggestion of punctures about 1 μ in diameter, very shallow, sparse. **Elytra:** 9 striate, striae fine, shallow, on apex stria 1 isolated, others connect as 2+9, 3+4, 5+6,7+8; intervals wide, flat, nearly impunctate as pronotum, interval 9 with 1 long sensory near apex. **Metasternum:** Alutaceous, nearly impunctate, nearly glabrous; same for remaining lateral and ventral surfaces. **Male characters:** Legs lack special characters. Median lobe of aedeagus broad, depressed; in dorsal view side nearly parallel, apex broad, blunt; in lateral view apex simple; basal apodeme stout, about as long as body of aedeagus. Endophallus with long, slender, coiled flagellum; base of flagellum an expanded sclerite. Tegmen short, broad; parameroid lobes short, membranous, lack macrochaetae; fenestrae small, round, widely separated; free ring of basal piece fused with tegminal plate; basal plate flat medially.

Etymology: The species is named in honor of the collector, the distinguished student of Curculionoidea, Robert S. Anderson.

In my preparation of the median lobe of the aedeagus for *Femtapion* it is not clear why the flagellum projects from the aedeagus as a coiled loop; it may be due to pressure of the coverslip. It is not known how the flagellum is normally oriented in the endophallus of *Femtapion*; it is not certain that the ejaculatory duct actually passes through this structure, although the flagellum appears to be a hollow tube.

In Kissinger (1968), key to the genera of Apioninae of the World, *Femtapion* will key to couplet 9. The last part of couplet 3, where *Megatracheloides* Lucas is keyed out on the basis of a tooth on the front femur, needs to be restated; reference to the absence of a flagellum should be deleted because it is not needed for the couplet to work properly. Couplet 9 should be modified as follows.

9. Body glabrous, minute, humeri absent; pronotum conical; frons much narrower than dorsal tip of rostrum; endophallus with coiled flagellum
 *Femtapion* Kissinger
 Without this combination of characters ...
 9A.
- 9A. Pronotum with sides nearly parallel; tarsal segment 1 longer than wide; endophallus lacks barlike process; Holarctic
 *Perapion* Wagner
 Pronotum with sides broadly rounded, widest near middle; tarsal segment 1 as wide as long; endophallus with pair of bar-like processes; North America
 *Podapion* Riley

Several genera of Aplemonini from Oceania (*Megatracheloides* Lucas, *Rhadinocyba* Faust, *Apotapion* Zimmerman) have a modified endophallic flagellum. This is of interest because Ithyce-ridae, Belidae, Eurhininae, Cyladinae and Nanophyinae also exhibit an endophallic flagellum which is modified in various ways as illustrated in Kissinger (1968).

At the present time with four apparent exceptions no apionine native to the Neotropical region is known to have an endophallic flagellum except for *Femtapion*. The flagellum of *Femtapion* shows differences compared with the Aplemonini from Oceania where the structure is tubular and straight. In *Femtapion* there appears to be a small irregular-shaped sclerite which may serve as the base of the flagellum; this may be analogous to *Apotapion* where the short flagellum is expanded laterally at its base (Kissinger, 1968, fig. 9o,p).

The most important exceptions are *Apion* (*Stenapion*) *clopaeum* Kissinger and *A. (S.) cnipum* Kissinger from Jamaica; a diagram of the endophallic flagellum is given in Kissinger (1974, fig 10 f,g,k,l). I do not have access to this material at

present and can make no further statement. The subgenus *Stenapion* Wagner contains 23 species restricted to the New World. The males of only a sample of the species have been dissected; 1 species from the Bahamas, *A. dozieri* Kissinger, and 2 species from Central America, *A. constricticollis* Sharp and *A. macrothorax* Wagner, do not have an endophallic flagellum; the last 2 species do have a large complicated sclerotized endophallic complex the exact arrangement of which has not been determined. A complex of characters exhibited by *Stenapion* is the narrow, elongate body form and short, stout rostrum, features also exhibited by some aplemonines such as *Rhadinocyba* Faust, *Neocyba* Kissinger, and *Perapion* Wagner.

The two apparent exceptions are *Apion lentum* Sharp and *A. neolentum* Kissinger. In both of these it appears that the dorsal plate of the median lobe of the aedeagus is produced into a long, fine whip-like process which projects over the length of the median lobe from base to well beyond the apex; see illustrations in Kissinger, 1968, plates 119a-c & 141a,b. This structure is not contained within the endophallus so it cannot be considered a flagellum. There is another case of an auxiliary filamentous structure being associated with the median lobe: the aplemonine *Myrmacyba postcallosa* Heller from New Guinea has the apex of the tegmen produced into a long filiform structure (Kissinger, 1968, plate 24 e,g).

A number of Nearctic and Neotropical apionids have 1 or more large, irregularly shaped sclerites in the endophallus. A possible working assumption is that these structures are derived from a flagellum-like structure. At the present time it is not known how these structures function during the process of insemination. Presumably the endophallus is everted and all of its structures take on a 3-dimensional relationship that only can be guessed at when viewed in a 2-dimensional relaxed, un-everted state using a compound microscope. Thompson (1988) demonstrated important taxonomic characters in *Leptostethus* Waterhouse (Entiminae) by inflating the endophallus, but a micro adaptation of his procedure would be needed because an *Apion* adult may be smaller than the median lobe of the entimine.

A third specimen of *Perapion wickhami* (Kissinger) was found: Scotts Bluff, Nebraska; 24/27 VI 1979, C. V. Nidek, 1 male. (Instituut voor Taxonomisch Zoologie, Amsterdam).

Addendum

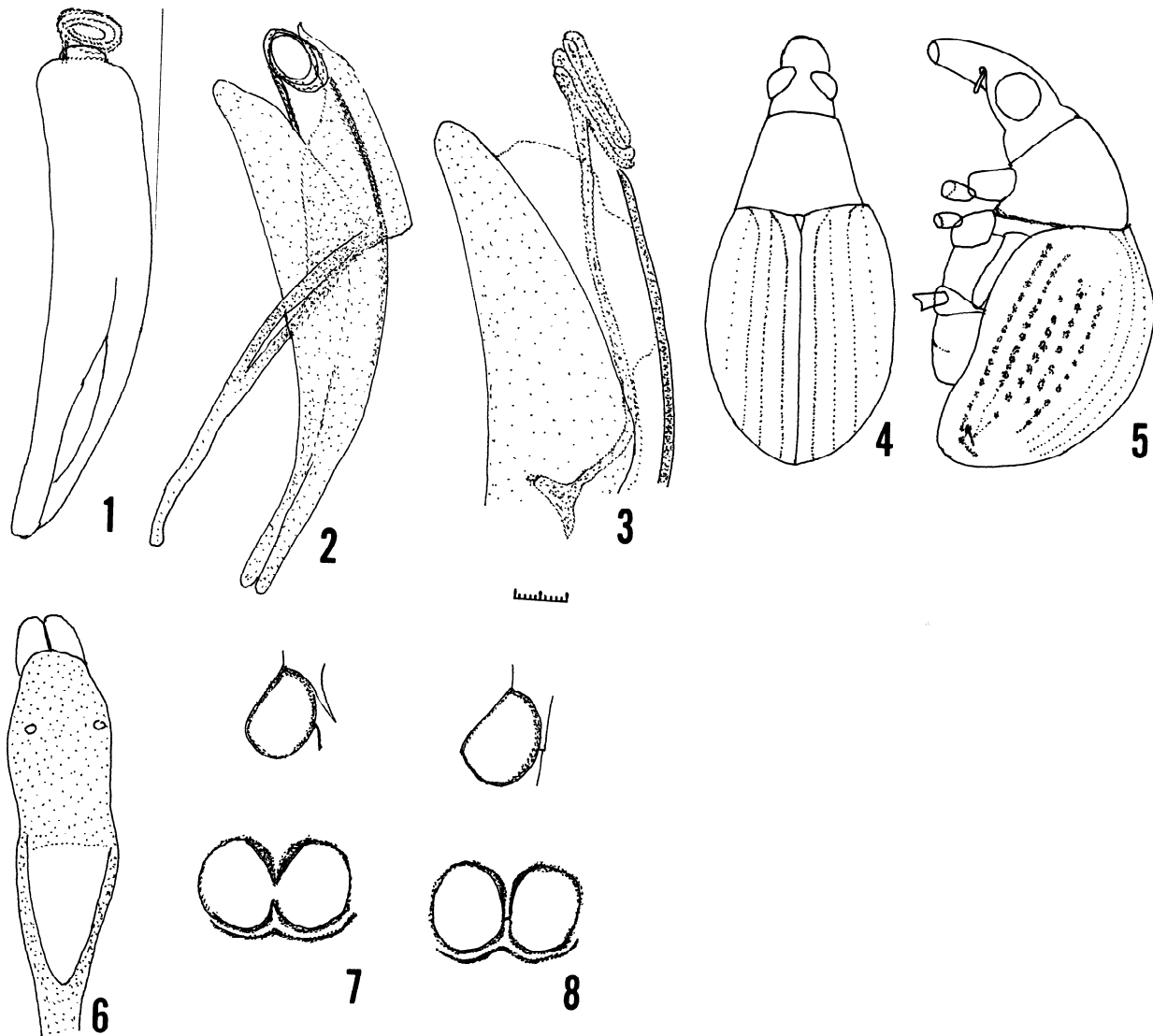
Kissinger (1990) described *Apion memnonmonum* from an imprecise locality in the "Valley of the Black Mts", North Carolina. During June 1990 the species was hand picked from unopened flower buds of *Amorpha* sp. about 3 mi NE Angelus Oaks, camp "Cedar Falls" near 6000', San Bernardino Co., California along with *Apion contusum* Smith; the latter species was associated by Kissinger (1988) with *Amorpha* sp. and is widely distributed from Quebec, Nebraska, Georgia, Texas, Arizona and California. While *contusum* has not been seen from North Carolina even though *Amorpha* undoubtedly occurs there, its wide distribution helps to make the unusual disjunct distribution of *A. memnonmonum* Kissinger more believable.

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Table 1. Measurement data for *Femtapion andersoni* Kissinger. N = number of observations used in mean and standard deviation (Std Dev). Measurements in microns (0.001 millimeters).

Structure/Measurement	Mean	Standard Deviation	N
Rostrum Length	256	18.0	3
Metarostrium Length	85	5.2	3
Lateral Mesorostrum Width	144	6.7	3
Dorsal Mesorostrum Width	155	9.0	3
Width Rostrum Dorsal Apex	121	14.9	3
Frons Width	48	5.5	3
Body Length	1368	65.8	3
Prothorax Length	390	10.4	3
Prothorax Width at Base	444	21.4	3
Prothorax Width at Middle	360	11.3	3
Prothorax Width at Apex	259	18.7	3
Elytra Width at Humeri	524	22.6	3
Elytra Width	670	10.4	3
Elytra Length	937	43.9	3
Femur I Length	402	18.0	3
Femur I Width	115	5.8	3



Figures 1 - 8. *Femtapion andersoni* Kissinger. Paratype, Chamela Biol. Sta. UNAM, Jalisco, MEXICO (DGK). 1) Median lobe of aedeagus, outline, dorsal view (tilted right slightly); 2) median lobe of aedeagus, lateral view; 3) median lobe of aedeagus, lateral view, detail of apex and projecting flagellum; 4) dorsal view; 5) lateral view; 6) paramere of tegmen, dorsal view. *Circapion circipenne* (Wagner). Cajamarca, Celendin area, PERU (RSA). 7) Diagram of gap between processes between mesocoxa, top: lateral view (with a left coxa removed, top of drawing is anterior), bottom: ventral view; 8) Diagram of union of processes between mesocoxa, comparable diagrams oriented as fig. 7; Scale = 189 μ for Fig. 4, 5, 7, 8; 54 μ for Fig. 1, 2, 6; 27 μ for Fig 3.