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A study of Hartig's *Xystus* species with type designations and new synonyms

(Hymenoptera: Cynipidae Alloxystinae and Charipinae)

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Abstract

Of the 26 *Xystus* species described by Th. HARTIG in 1840 and 1841, 19 lectotypes are designated; 5 holotypes and lectotypes had been designated earlier, and the names of two species must be considered nomina dubia. Of the 24 species with available names 18 are referred to the genus *Alloxysta* Förster, 4 to *Phaenoglyphis* Förster, one to *Dilyta* Förster, and one to *Synergus* Hartig. Full synonymy, as far as known to-day, is given.

Allotria victrix Westwood, 1833, was the first species to be described in what we now consider Alloxystinae, a group of aphid hyperparasites through Braconidae Aphidiinae and Aphelinidae (Hymenoptera) as primary parasites. In 1838 CURTIS and ZETTERSTEDT each described two or three species in the genus *Cynips* Linnaeus, which may also be referred to Alloxystinae.

HARTIG (1840, 1841) was the first to compose a monograph of this group. Obviously, at that time he did not know the papers by WESTWOOD, CURTIS, and ZETTERSTEDT. In 1840 he described 10 species in his new genus *Xystus*, to which in 1841 he added 16 more, with a key to the identification of the 26 species. It was only later (HARTIG, 1843) that he realized *Xystus* to be a junior synonym of *Allotria* Westwood, 1833.

HARTIG's descriptions are very short and refer only to superficial characters in which colouration ranks first. Unfortunately, in this group discolouration of specimens that have been kept for a long time, is a general phenomenon. Furthermore, some parts of the body, e. g. the pronotum, propodeum and the base of the gaster, seem more liable to discolouration than other parts. HARTIG seems to have stored a large number of his specimens during a long period before drawing up the descriptions. Thus, for instance, where he mentions the base of the gaster being rufous, as he frequently does, the gaster may be entirely black in fresh specimens.

Morphological characters concerning the radial cell are only roughly indicated by HARTIG as open, closed, small, very small, elongated, etc. The same holds for the antennae: longer than gaster, clavate, somewhat clavate, etc., and for the propodeum: pilose, somewhat pilose, etc.

Though HARTIG's descriptions and his key are insufficient and unreliable to a high degree, they were the basis of knowledge on which later workers founded their new species. In this respect THOMSON, CAMERON and KIEFFER have to be mentioned particularly. None of these authors seems to have consulted HARTIG's material and thus it is not surprising that many doubts and controversies arose. In fact descriptions of new species by later authors, though often more elaborate, are also insufficient. Even if the relative lengths of the antennal segments are taken into account, a character emphasized by HELLEN (1963), it appears impossible to draw any conclusion in respect to the identity of the species in question.

A thorough investigation of HARTIG's material seems a prerequisite before any real taxonomic progress can be made in this difficult group of parasitic Hymenoptera. This has to be done in combination with the handling of more crucial characters than hitherto used.

I have had the *Xystus* material of HARTIG on loan from the "Zoologische Staatssammlung" at Munich (BRD) for several years. In earlier papers a number of the types were designated (EVENHUIS, 1972, 1974, 1978; EVENHUIS & BARBOTIN, 1977; QUINLAN, 1978). In the present paper I designate the types of the remaining species, except for two, the types of which must be considered lost.

I have compared the lectotypes with specimens reared from aphid mummies or specimens captured in the field by me or by colleagues. Special attention was paid to the structure of the antennae, the shape and position of pronotal carinae if present, the pattern of pubescence of pronotum, the structure of carinae on the propodeum if present and its pattern of pubescence, the shape of the radial cell in the fore wing, and the shape of the two dorsal hair patches at the base of the gaster.

HARTIG used to glue his specimens on the point of a very small, whitish, triangular piece of paper, perforated by the pin. Unfortunately the glue sometimes covers characters essential for identification. One pin may bear several specimens, individually mounted on separate card triangles. Many of the pins are additionally provided with small pieces of paper of different colour and shape. Sometimes there is a small label with a number. I have yet to understand their meaning. Many pins are not accompanied by any sign at all.

A label with the species name in HARTIG's handwriting precedes each series of specimens, which are obviously intended as syntypes. In some cases it is the first pin of a series that bears this label; in other cases the speciesname label is placed separately.

After the label "*femoralis* m." there is only one specimen present, its pin containing a green, folded label, perforated twice by the pin, with the name "*Xystus melanogaster*" in HARTIG's handwriting. This obviously wrong placing leads me to suspect that other pins might have been displaced. Therefore types are only designated as lectotypes, even when only one specimen is present. The remaining "syntypes" I have indicated with a white label "In collection Hartig as *Xystus* ..." (in the place of the dots the name of the species in question).

In the following list the species have been arranged in alphabetical sequence. I give what I consider the valid names and place them in four genera: *Alloxysta* Förster, 1869 (18 species), *Phaenoglyphis* Förster, 1869 (4 species), *Dilyta* Förster, 1869 (one species), and *Synergus* Hartig, 1840 (one species). The types of two species are lost and their names must be considered nomina dubia.

The two former genera belong to the subfamily Alloxystinae, the third one to Charipinae. As to the intricate nomenclatorial justification of these subfamily names I refer to QUINLAN & EVENHUIS (1980). The *Synergus* species belongs in the subfamily Cynipinae and has been dealt with by QUINLAN (1978).

ROHWER & FAGAN (1917) state that there is evidence that HARTIG's first paper dates from 1839 and not from 1840 as indicated on the title page. These authors (ROHWER & FAGAN, 1917, 1919) cite 1839 in parentheses, followed by 1840 without parentheses. In order not to make matters unnecessarily complicated, I have only maintained the date 1840. As far as the present paper is concerned, this does not have any nomenclatorial consequence.

For most species some details are communicated, particularly on known host relationships. More extensive morphological descriptions will be given in future papers.

Alloxysta aperta (Hartig)

Xystus apertus Hartig, 1841 (♀)

There are two pins, each with one specimen, a female and a male. I designate the former the lectotype; the pin bears a small, grey, quadrangular paper.

I possess some specimens which I refer to this species and which were kindly sent to me by Mr. F. Barbotin, St.-Malo, France. They were reared from aphid mummies on grasses, the primary parasite being *Aphidius uzbekistanicus* Lutzhetzki.

Alloxysta brachyptera (Hartig)

Xystus brachypterus Hartig, 1840 (♀)

There are three specimens, each on a separate pin, which, according to my opinion, are conspecific. HARTIG states the sex to be female, but all three specimens are males. Still I assume that HARTIG had these specimens before him when he described the species.

The wings of one specimen are less reduced and reach to the end of the abdomen; the radial cell is visible. Thus, regarding HARTIG's description, this specimen cannot be regarded lectotype.

I designate one of the two other specimens lectotype. The pin bears a small whitish label with "310".

This species has often been captured in the Netherlands, especially by sweeping low vegetation. I only saw males. I presume the female to be fully winged.

Alloxysta castanea (Hartig)

Xystus castaneus Hartig, 1841

Allotria ruficollis Cameron, 1883, syn. n.

Alloxysta rubriceps Kieffer, 1904, syn. n.

Alloxysta erythrothorax (Hartig), var. *dubia* Kieffer, 1904, syn. n.

Charips pruni Hedicke, 1928, syn. n.

There are two female specimens on one pin. They are discoloured to a high degree. The pin contains a grey label with the number "638" and also HARTIG's species label "*castaneus* m.". I designate the lowermost lectotype of *Xystus castaneus* Hartig, because it is mounted in the most favourable way for study. I discussed this species in earlier papers (EVENHUIS, 1971, 1978).

The species is a common hyperparasite of *Hyalopterus pruni* (Geoffroy) through *Praon volucre* (Haliday) as the primary parasite both on *Prunus* spp. and *Phragmites australis* Cav. (Trin. ex Steud.).

Phaenoglyphis cincta (Hartig) comb. n.

Xystus cinctus Hartig, 1841 (♀)

There are two pins, each with a single female specimen. One is an *Alloxysta* species with an open radial cell and thus cannot be considered lectotype.

The other specimen is a *Phaenoglyphis* species with complete mesoscutal furrows; I designate it as lectotype. The pin bears a whitish, trapezoid label with the number "131".

Alloxysta circumscripta (Hartig)

Xystus circumscriptus Hartig, 1841 (♀)

There are two pins, containing one and four specimens, respectively. I designate the single specimen the lectotype. The pin does not contain any sign or label.

This species is a common hyperparasite of *Uroleucon* species on Compositae through *Praon dorsale* Haliday as primary parasite.

Alloxysta cursor (Hartig)

Xystus cursor Hartig, 1840 (♂)

Only one male is present, which has the funiculus of both antennae missing. The pin does not bear any label or indication; the species-name label stands separately left of it. I designate this specimen lectotype.

A number of specimens belonging to this species have been captured in the Netherlands, but the hosts are still unknown.

Alloxysta defecta (Hartig)

Xystus defectus Hartig, 1841 (♀♂)

There are 8 pins, 5 of which bear a single specimen. One of these, a female, I designate lectotype; the pin bears a small, whitish, quadrangular paper.

There is an absurdity in HARTIG's descriptions. In his key the antennae are indicated unicolourous, whereas according to his fuller description they should be brown with a red base. In the lectotype the base is somewhat lighter than the rest of the antennae, though this is not easily seen because of discolouration.

I have reared this species frequently from *Uroleucon* spp. on Compositae, *Trioxys centaureae* (Haliday) being the primary parasite.

Alloxysta victrix (Westwood)

Allotria victrix Westwood, 1833

Xystus erythrocephalus Hartig, 1840 (♀♂)

Allotria macrocera Thomson, 1877

In an earlier paper (EVENHUIS, 1972) I designated as lectotype one female out of 50 specimens; in that publication I wrongly referred to 47 specimens. The remaining 49 specimens, belonging to several species, are mounted on 20 pins.

In the 1972 publication I proposed to omit *Allotria macrocera* Thomson as a synonym. However, during my stay in Lund, Sweden, 1978, I studied THOMSON's 5 conspecific types, mounted on 4 pins, and found them to belong to *Alloxysta victrix* (Westwood). The colour of the head being straw-yellow ("flavostramineus") as mentioned in THOMSON's paper (1877), is a result of discolouration. I designate the top most specimen on the pin containing two specimens as lectotype of *Allotria macrocera* Thomson. Besides the name label "*macrocera*" in THOMSON's handwriting, it contains also a label with the first letters of "Lindholmen", the locality given by THOMSON. Obviously the right hand part of the label has been cut off.

It is noteworthy that KIEFFER (1902) synonymized *Allotria macrocera* Thomson, 1877, with *Allotria xanthocera* Thomson, 1862, and that DALLA TORRE & KIEFFER (1910) synonymized *Allotria macrocera* with *Charips victrix* (Westwood), maintaining the incorrect synonymy of *Allotria macrocera* and *Allotria xanthocera*.

Xystus erythrothorax Hartig, 1840 (♂)

This species was discussed earlier (EVENHUIS, 1970). There are two pins, one of which has two triangles from which both specimens are lost. The pin contains a piece of dried leaf with a black aphid mummy. HARTIG states „Aus der schwarzen Pflaumen-Blattlaus“, which is a different matter as a black mummy. The pin also bears a small blue label with "916" and furthermore the species-name label "*erythrothorax* m.". The other pin contains a female specimen of *Alloxysta pleuralis* (Cameron) and can not be considered lectotype.

The identity of this species can not be elucidated and the name must remain a nomen dubium.

Xystus femoralis Hartig, 1841 (♂)

As mentioned before, there is only one pin with a single specimen, bearing a green label "*Xystus melanogaster*". Thus it can not be considered the lectotype of *Xystus femoralis* Hartig. The types of this species must be considered lost; the name is a nomen dubium.

Alloxysta flavicornis (Hartig)

Xystus flavicornis Hartig, 1841 (♀)

There are three pins, two of which contain one specimen, a female and a male respectively, and the other pin two specimens. I designate the single female specimen as lectotype; the pin bears a blue label with the number "1506".

I reared several specimens from dark brown mummies of *Periphyllus* spp. on the leaves of *Acer* spp., collected in spring. The primary parasite is *Trioxys falcatus* Mackauer.

Alloxysta fuscicornis (Hartig)

Xystus fuscicornis Hartig, 1841 (♀)

Allotria ancylocera Cameron, 1886, syn. n.

Allotria brassicae Ashmead, 1887, syn. n.

Allotria victrix Westwood, var. *infusata* Kieffer, 1902, syn. n.

There is only one pin with a single, strongly discoloured, female specimen, which I designate lectotype of *Xystus fuscicornis* Hartig. The pin bears a small, square, whitish paper; it also contains HARTIG's species label "*fuscicornis* m.".

The species is, as reported in earlier publications in which I dealt with it (EVENHUIS, 1972, 1974, 1978), a common hyperparasite of *Brevicoryne brassicae* (Linnaeus) through *Diaeretiella rapae* (McIntosh) as a primary parasite.

Phaenoglyphis heterocera (Hartig) comb. m.

Xystus heterocerus Hartig, 1841 (♂)

Phaenoglyphis heraclei Dettmer, 1925, syn. n.

There are 4 pins, containing 13 specimens. Two of the pins each contain a single male specimen, which are conspecific. They belong to a *Phaenoglyphis* species with complete mesoscutal furrows. The third antennal segment is the same as in the males of other *Phaenoglyphis* species, rather long, flattened and curved. If looked at from one direction, this segment might be taken about as broad as the scape, a character mentioned in HARTIG's description. One of the two single specimens I designate lectotype. The pin is accompanied by a grey label with the number "637". The two remaining pins bear 5 and 6 specimens, respectively.

It is my opinion that the morphological characters of *Phaenoglyphis* species, in regard to carinae and pubescence of pronotum and propodeum and to the two hair patches at the base of the gaster, are much more uniform than in most *Alloxysta* species. I think it justified to consider *Phaenoglyphis heraclei* Dettmer a synonym. DETTMER (1925) states that he captured 53 females and 2 males. However, Mrs. F. N. Dingemans-Bakels, in charge of the insect collections of the "Natuurhistorisch Museum", Maastricht, the Netherlands, could only find five pins with labels indicating that the insects they bear belong to the type material of *Phaenoglyphis heraclei* Dettmer. The specimens have each been mounted on a micropin on a piece of elder-pith, perforated by the ordinary insect pin. One of the specimens is lost. The remaining four are heavily damaged, the head being lost in all. I designate the least heavily damaged, a female, as the lectotype. Its pin is accompanied by three labels: "*P. heraclei* Dettm. ♀", "Slagharen, H. Dettmer" and "Heracl. 4. 8. 24". The three remaining syntypes, accompanied by similar labels, I designate paralectotypes.

I have reared this species several times from the mummies of *Cavariella* sp., parasitized by *Trioxys* sp., in the inflorescences of *Heracleum sphondylium* L. I also captured it quite often from the inflorescences of the same plant species. DETTMER, too reports it to be captured from the inflorescences of *Heracleum sphondylium*.

Alloxysta leunisii (Hartig)

Xystus Leunisii Hartig, 1840 (♀)

There are 8 pins containing 10 specimens; furthermore there is one pin from which the specimen is lost. One of the pins contains a female specimen, which I designate lectotype. The pin bears also a small triangular, gold-coloured paper.

I have reared a female of this conspicuously large species from a large mummy of *Uroleucon* sp. on *Centaurea pratensis* Thuill., collected at Reeuwijk, 8-8-1979.

Phaenoglyphis longicornis (Hartig)

Xystus longicornis Hartig, 1840 (♀)

The only specimen, a female with incomplete mesoscutal furrows, was discussed in an earlier paper (EVENHUIS, 1978), where I designated it as holotype.

Alloxysta longipennis (Hartig)

Xystus longipennis Hartig, 1841 (♀)

There is only one pin with one female specimen. The pin contains a grey label with the number "1149". It also contains HARTIG's species-name label "*longipennis* m.". I designate the specimen lectotype.

Alloxysta macrophadna (Hartig)

Xystus macrophadnus Hartig, 1841 (♀)

Alloxysta scutellata Kieffer, 1902

I discussed this species in an earlier paper (EVENHUIS, 1974), where I designated the female on a single pin the lectotype. The pin bears a small, square, whitish paper and also HARTIG's species-name label "*macrophadnus* m.".

This species is a common hyperparasite of *Acyrtosiphon pisum* (Harris) on *Medicago sativa* L. and related plants through *Aphidius ervi* Haliday as primary parasite.

Alloxysta melanogaster (Hartig)

Xystus melanogaster Hartig, 1840 (♂)

There are 7 pins, containing 10 specimens. Five pins bear each a single specimen. I designate one single male lectotype. The pin bears a small, whitish, rectangular paper.

HARTIG ranges this species under those with a closed radial cell. With a low magnification it seems closed, indeed. If, however, seen with a magnification of x 70, with transmitted light, it appears to be partly open. In other respects it suits HARTIG's description better than the other specimens present.

Alloxysta minuta (Hartig)

Xystus minutus Hartig, 1840 (♀)

Allotria ramulifera Thomson, 1862, syn. n.

There are 5 pins, two of which contain a single female specimen. HARTIG (1840) mentions "areola radialis minutissima", thus I designate the specimen with the smallest radial cell as lectotype. It is indeed the species with the smallest radial cell amongst Alloxystinae that I have seen. The pin bears a small whitish paper. The other single, heavily damaged specimen is *Alloxysta mullensis* (Cameron). In the Thomson collection at Lund there are three conspecific female specimens under the name *Allotria ramulifera* which belong to *Alloxysta minuta* (Hartig). In the Dahlbom collection, also at Lund, there is a conspecific female specimen glued with its right side to the pin, with a label "*All. ramulifera* n. ♀" in THOMSON's handwriting. I designated this specimen as the lectotype of *Allotria ramulifera* Thomson. It also contains a label "Åreskutan 1840. 18. 10".

This small species has often been captured in the Netherlands by sweeping low vegetation. I do not know the hosts. It is conspicuous by its very small radial cell. To date I have seen only female specimens.

Alloxysta pilipennis (Hartig)

Xystus pilipennis Hartig, 1840 (♀)

There are 11 specimens, mounted on 6 pins. The specimen that I designate lectotype is a single female on a pin, accompanied by a blue label "1709".

Alloxysta postica (Hartig)

Xystus posticus Hartig, 1841 (♀)

There is only one pin with one female specimen, which I designate lectotype. The pin contains only HARTIG's species-name label "*posticus* m." and no other labels or signs.

Alloxysta obscurata (Hartig)

Xystus obscuratus Hartig, 1840 (♀)

There are 10 specimens, mounted on 5 pins. The specimen on another pin is lost.

One single specimen on a pin with a small blue label "1751" is a male and thus can not be considered lectotype. There are two more specimens, each on a separate pin, which are females of *Phaenoglyphis villosa* (Hartig). Three specimens glued collectively on one paper triangle, an unusual way of mounting by HARTIG, are far too small to be considered lectotype.

The remaining pin has four specimens, the two upper conspecific. The second from the top is best suited as lectotype, and thus I designate it as such. The pin is provided with a small grey triangular paper.

The species is the same that I reared on several occasions from *Euceraphis punctipennis* (Zetterstedt) through *Praon volucre* (Haliday) on *Betula* spp. In HARTIG's description there is the restriction "... aus Weidengallen des Nem. Valisnerii", which sawfly is *Pontania proxima* (Lepeletier). The host plant record seems in contradiction with the fact that the species should be a hyperparasite of an aphid on birch. However, winged specimens of parasitized *Euceraphis punctipennis* were often found on other food plants than birch. HARTIG most probably put several galls of *Pontania proxima* in one vial and thus he certainly overlooked the parasitized aphids.

Attention must be drawn to the fact that the character "alis obscuratis", mentioned in HARTIG's description, does not show particularly in any of the specimens under the name *Xystus obscuratus* in his collection. I have never found any other species of Alloxystinae in which this character is conspicuous.

Alloxysta rufiventris (Hartig)

Xystus rufiventris Hartig, 1840 (♂)

There are three specimens under this name, two males and one female, each mounted on a separate pin. I designate one of the males lectotype; the pin does not bear any sign or label. The other male has a closed radial cell and can not be considered the lectotype since HARTIG ranges the species under those with an open radial cell.

Synergus testaceus (Hartig)

Xystus testaceus Hartig, 1841 (♀)

This species, that does not belong to Cynipidae Alloxystinae, was discussed by QUINLAN (1978), who designated the only specimen as the holotype.

Dilyta trapezoidea (Hartig) comb. n.

Xystus trapezoideus Hartig, 1841 (♂)

Allotria xanthocephala Thomson, 1862, syn. n.

There is only one pin with a male specimen which I designate lectotype. The pin also contains a small, rectangular, whitish paper with dark, parallel stripes; it also bears HARTIG's species-name label, however written "*trapezoides*" and not "*trapezoides m.*".

The specimen is a *Dilyta* species, almost identical with *Allotria xanthocephala* Thomson, 1862, except for the colour of the head. I saw two specimens under the latter name in the Dahlbom collection. Only one of them satisfies the description by THOMSON (1862, 1877). I designate this specimen the lectotype of *Allotria xanthocephala* Thomson, 1862. The pin bears three labels, from the top downwards a small green label with "33. ♀", a small white label "30", and the species-name label "*All. xanthocephala*. Db.". Above the green label there is a very small grey paper. The specimen has been glued with the dorsal side of the thorax to the pin. The other specimen is a male *Phaenoglyphis xanthochroa* Förster, 1869, and can not be considered lectotype.

Xystus trapezoides Hartig also satisfies the description of *Glyptoxysta xanthocephala* (Thomson) by KIERYCH (1979), who did not see the Lund type material. KIERYCH does not give colour characters.

The head in the lectotype of *Xystus trapezoides* is dark, whereas it is yellow in the lectotype of *Allotria xanthocephala* Thomson. Dr. E. Kierych, Warsaw, Poland, was so kind as to send me a male and a female of *Glyptoxysta xanthocephala* from Poland. Indeed the head of the male appears to be dark, whereas it is yellow in the female.

The name *Allotria xanthocephala* was used for the first time by DAHLBOM (1842) without a description. Consequently *Allotria xanthocephala* Dahlbom, 1842, was mentioned by KIEFFER (1904) as a nomen nudum. In fact *Allotria xanthocephala* Dahlbom and *Allotria xanthocephala* Thomson are one and the same species. It is noteworthy that THOMSON (1862) stated it to be found by ZETTERSTEDT, without reporting anything about DAHLBOM's reference.

According to modern classification of Cynipodea, this species belongs to Cynipidae Charipinae, whereas *Alloxysta* and *Phaenoglyphis* belong to Cynipidae Alloxystinae. The former, as far as is known to-day, are exclusively parasites of Psylloidea, the latter hyperparasites of Aphidoidea through Braconidae Aphidiinae and Aphelinidae as primary parasites (QUINLAN & EVENHUIS, 1980).

Phaenoglyphis villosa (Hartig)

Xystus villosus Hartig, 1841 (♀)

Allotria piciceps Thomson, 1862

Allotria dolichocera Cameron, 1889

Allotria collina Cameron, 1889

Allotria Carpentieri Kieffer, 1902

Allotria foveigera Kieffer, 1902

Allotria curvata Kieffer, 1902

Allotria recticornis Kieffer, 1902

Alloxysta subaperta Kieffer, 1904

Alloxysta campyla Kieffer, 1904

This species was discussed by EVENHUIS & BARBOTIN (1977). Only one discoloured specimen is present; it was designated holotype in the 1977 publication. It is no doubt the most common species of Alloxystinae in Europe and it also occurs in other parts of the world. It is widely specialized, both in regard to the aphid hosts and to the primary parasites. I suspect that still more synonyms await discovery.

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