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The Typus Generis of *Dysaphis* BÖRNER, 1931 (Homoptera, Aphididae)

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The genus *Dysaphis* was erected by BÖRNER (1931) for a group of species previously placed in *Anuraphis* DEL GUERCIO. The generic diagnosis reads: « Bei *Dysaphis* gen. nov. ist das Pronotum mit je 2 Marginal-, je 1 Spinal- und je 1 Pleuralborste versehen. Typus dieser Gattung ist *Aphis angelicae* KOCH. Mit dieser Art nahe verwandt, aber nicht identisch, ist *D. (Dentatus) communis* MORDV. (= *Anuraphis angelicae* BÖRN., non KOCH), welche an Apfelblättern im Frühjahr auffällige rote Faltengallen erzeugt und über Sommer an Wurzelstock und Wurzeln von *Anthriscus*- und *Chaerophyllum*-Arten lebt (BÖRNER, 1926) ».

The reference to BÖRNER, 1926, is to a list of heteroecious aphids published in Abderhalden's « Handbuch der biologischen Arbeitsmethoden »: here is found a reference to *Anuraphis angelicae* KALT. (*sic*) (*crataegi* auctt., *kochi* DAVIS). The host plants of this species are given as *Malus* (primary), *Anthriscus* and *Angelica* (secondary). It thus appears that up to 1926 BÖRNER regarded as conspecific aphids living in summer on *Angelica* and *Anthriscus*, but that between 1926 and 1931 he came to realize that two separate species existed, and in 1931 expressly chose the species from *Angelica* to be the typus generis of *Dysaphis*.

A slight amplification of the position is given by BÖRNER & SCHILDER (1932). The genus *Dysaphis* is used to include the two species *communis* and *angelicae*. Under the latter species is given the following information: « Fundatrix und Fundatrigenien sind nicht bekannt. BÖRNER erzog die Sexuellen an Apfel und setzte daher *angelicae* mit der Bildnerin der roten Wulstgallen an Apfelblättern (*communis*) gleich; Übertragungsversuche von Apfel auf *Angelica* bestätigten diese Ansicht aber nicht. »

BÖRNER (1940) used the generic name *Yezabura* MATSUMURA in association with *angelicae* KOCH. His reason for so doing became apparent in 1950, when he published a short paper in which he makes the following statement: « *Dysaphis* CB. 1931. Diese Gattung wurde von mir für die an Apfelblättern die bekannten roten oder gelben Faltengallen erzeugenden *Yezabura*-Arten aufgestellt, mit *Dentatus communis* MORDV. 1929 als Typus. Den Typus identifizierte ich mit der im Sommer an *Anthriscus silvester* lebenden Art. » In the same paper he renamed his previous interpretation of *communis* MORDVILKO,

giving it the name *anthrisci*, nom. nov., on the grounds that he now believed *communis* to be the same as *Aphis radicola* MORDVILKO.

This rather curious turn of events was amplified (1952) in BÖRNER's catalogue «Europae centralis Aphides». Here we find the following items in the generic and species lists:

«26(91). Gen. *Dysaphis* CB. 1931. T. a. *Aphis angelicae* CB. 1931 non KOCH 1854 = *anthrisci* CB. 1950.»

«351. *D(ysaphis) anthrisci* CB. 1950. (Syn. *Anuraphis angelicae* CB. 1926 non KOCH 1854, *Dysaphis communis* CB. 1932 non MORDV. 1929.)»

«363. *Y(ezabura) angelicae* (KOCH 1854). (Syn. *Aphis angelicae* KOCH 1854 non CB. 1932). Migr.-Test BÖRNER 1931.»

This concludes BÖRNER's published work on the genus *Dysaphis*, apart from a recapitulation published after his death (BÖRNER & HEINZE, 1957) that gives no new information. It seems desirable to discuss the question of the type fixation further in the light of more recent work.

The various statements quoted above from the papers published by BÖRNER in 1950 and 1952 are directly contradictory of what he actually wrote in 1926 and 1931, as STROYAN (1957) has pointed out. HILLE RIS LAMBERS (1959), however, has followed BÖRNER (1950) in stating that *Dysaphis* was erected with *communis* MORDV. as the nominal typus generis, and has argued from this that it would be logical to suppose that *Aphis devector* WLK. (the real *communis* of MORDVILKO) should be the true typus generis of *Dysaphis*.

There can be no doubt that the nominal typus generis of *Dysaphis* is *Aphis angelicae* KOCH, unless it be conceded that an author may with impunity reverse his original type citation in a later work, a position considered unacceptable by HILLE RIS LAMBERS in the case of the genus *Nectarosiphon* SCHOUTEDEN; in this opinion I entirely concur. However, there is apparently some reason for doubts as to what species BÖRNER actually had before him as *Aphis angelicae* KOCH at the time that he erected *Dysaphis*. It may well be asked how he could ignore the fact that his cited typus generis did not agree with his morphological diagnosis (*angelicae* KOCH has no pleural pronotal hairs unless as a rare idiosyncrasy in single specimens). This discrepancy, coupled with the account given in 1932 of the rearing of sexuales on apple, and the synonymy given in 1952, indicating that the 1932 account referred to a species other than the real *angelicae* KOCH, gives reason to suppose that BÖRNER may really have misidentified another species, one of the apple-feeding *anthrisci-chaerophylli-radicola* complex, as *angelicae*.

It has proved possible to throw some light on this question by an examination of the material of *angelicae* and *anthrisci* from BÖRNER's collection, now in the keeping of the Deutsches Entomologisches Institut, Berlin. Through the kindness of Prof. Dr. H. SACHTLEBEN, the Director of the Institute, I have been enabled to examine all the material of both species present in the collection, and to make microscopic preparations where necessary. The results provide an explanation of the apparent anomalies referred to above.

Prior to the publication of the genus *Dysaphis* in early 1931 BÖRNER had in his possession only one collection of *angelicae* from *Angelica*, if the present composition of his material is to be relied upon. This collection is now contained in four slides, one of which is an original mount by BÖRNER, while the other three have been made from the contents of two tubes of alcoholic material. The labels in one of these tubes (there are two apart from the accession label, both agreeing apart from small details, and the later having been apparently copied from the earlier, which is now partly illegible) read « *Angel(ica) silv(estris)* (morph symbol). ♀ auf Apfel erzogen. Starenberg See, Sept. 1920 ». The name « Starenberg » is changed to « Starnberger » on the later label, and the morph symbol is altered. Apart from these points the data coincide, and both labels are in BÖRNER's handwriting. The other tube contains a label bearing the legend « (deleted) *angelica*. Starenberg See. 1.10. » No year is given, but the date agrees with the label of the only slide with corresponding data, which reads : « *Angelica*. Starenberg See. 1.10.20. » Further, the contents of the slide correspond with those of the second tube. There is little doubt that the two tubes and the slide all form a single sample, the composition of which is as follows : *Adults*, one apterous and four alate viviparous females, six males (alate) and one oviparous female ; *immature*, two winged nymphs (probably males) and one oviparous female. Of these, the original BÖRNER slide holds only one very badly damaged male and the two nymphs.

The rest of the material, from the two tubes, was in a very damaged state, and the resulting mounts were far from satisfactory, since it was considered essential to avoid excessive maceration before clearing, and the obdurate embryos and flight musculature obscured much detail and promoted crushing by osmosis in the mounts. However, by examination immediately after mounting it was possible to make out the most essential characters needed for identification of the aphids. In all characters that can be examined the sample agrees excellently with British autumnal material of *angelicae* KOCH, and not with any species of the apple-feeding complex. The single aptera has no pleural hairs on the pronotum and no marginal tubercles on the seventh abdominal segment ; its maximal hair length on the third antennal joint is 0.022 mm, the articular diameter of the joint being 0.027 mm. ; the maximal hair length on the second and third abdominal tergites is about 0.024 mm. In the four alatae marginal tubercles are also absent from the seventh abdominal segment ; secondary rhinaria up to about five in number are present on the fifth antennal joint ; the maximal hair length on the third antennal joint is about 0.018 mm., and that on the third abdominal tergite about 0.030 mm., the apices of both groups of hairs being not very acute. The oviparous female has five-jointed antennae with the maximal hair length on the third joint about 0.014 mm. The males have the apical rostral segment 0.16 mm. in length and are without marginal tubercles on the seventh abdominal segment.

The inferences that may be drawn from the circumstances described above are twofold : first, that BÖRNER succeeded in rearing one ovipara of *angelicae* to maturity, and one to the second instar, on apple, although the true primary host, as he later established, is *Crataegus*. But this is not a very improbable achievement if senescent leaves or detached twigs of apple were used in the experiment. Second, one may infer from the absence of any slides containing viviparae in his collection, save those with dates in or after July, 1931, that at the time of publishing the description of *Dysaphis* he had not ever examined critically any viviparous morphs of *angelicae*. If this is so it becomes rather easy to accept the fact of his overlooking the pronotal chaetotaxy of *angelicae*. There remains little reason to challenge the identity of the species cited by BÖRNER as the *typus generis* of his genus, so far as the material now standing under the name *angelicae* in his collection is concerned.

In order to confirm this interpretation further, I have examined all the alcoholic and slide material of *anthrisci* BÖRNER, 1950, now standing over the number EcA 351 in the collection, lest any samples originally identified as *angelicae* (before 1926) might have been subsequently transferred to *anthrisci*. Out of 14 pre-1932 samples none contains any autumnal material, and no record exists on the labels of any transference to *Malus* from a secondary host. A single oviparous female was found in one sample labelled as having been reared from *Anthriscus silvestris* on 19.VI.1922, but this is probably an intruder. All other samples consist exclusively of alate and apterous viviparae or fundatrices, with their progeny. The latest date in any sample prior to 1932 is July 31. Therefore I believe that the sample of *angelicae* from Starenberg See represents the material on which both the type fixation of *Dysaphis* (1931) and the biological account of *angelicae* (1932) were based ; and that, since this sample was correctly determined, no grounds exist for the acceptance of subsequent statements that the *typus generis* of *Dysaphis* is other than the species named by BÖRNER in the original citation.

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