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On the validity of *Chaitophorus parvus* H.R.L., with comments on
Ch. lapponum OSSIANNILSSON and *Ch. mordvilkoii* MAMONTOVA
(Homoptera: Aphididae)

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The correct identification of *Chaitophorus salijaponicus niger* MORDVILKO, 1929, *Ch. parvus* HILLE RIS LAMBERS, 1935, *Ch. lapponum* OSSIANNILSSON, 1959 and *Ch. mordvilkoii* MAMONTOVA in SZELEGIEWICZ, 1961, presents taxonomic problems. This paper considers the contribution of different investigators to the morphological characterization and the differentiation of these taxa, together with the study of material relating to these species in various European countries. This analysis allows a differentiation between *Ch. parvus* and *Ch. salijaponicus niger*, so we cannot accept the synonymy proposed by HOLMAN & PINTERA (1977) and PINTERA (1987). Moreover, the taxonomic position of *Ch. lapponum* and *Ch. mordvilkoii* is discussed; as a result of the biometric and biological data, we consider it possible that *Ch. mordvilkoii* is a subspecies of *Ch. lapponum*. Finally, we offer a key for the identification of these taxa.

Keywords: Taxonomy, key, *Chaitophorus*, *salijaponicus*, *parvus*, *lapponum*, *mordvilkoii*.

INTRODUCTION

The presence in León (Spain) on *Salix purpurea* ssp. *lambertiana* of some apterous aphids which seem similar to *Chaitophorus mordvilkoii* MAMONTOVA in SZELEGIEWICZ by the short length of processus terminalis on antennal segment VI and by the dorsal pigmentation, although the siphunculi show a membranous area around their base and lack a nitid reticulation, was reported by TIZADO (1991).

An attempt to correctly identify this and other similar Spanish samples has given rise to various taxonomic problems, relating to four species of the genus *Chaitophorus* KOCH, 1854: *Ch. salijaponicus* ESSIG ET KUWANA, 1918 (in particular of the subspecies *Ch. salijaponicus niger*), *Ch. parvus* HILLE RIS LAMBERS, 1935, *Ch. lapponum* OSSIANNILSSON, 1959 and *Ch. mordvilkoii* MAMONTOVA in SZELEGIEWICZ, 1961.

MATERIAL STUDIED

A study has been made exclusively of apterous viviparous females collected on different species of *Salix* in various European countries: Spain (material from the collection in the Department of Animal Biology, University of León), Poland, Norway, Denmark, Austria and Italy (material from The Natural History Museum of London). The data on their respective labels are as follows; later, we shall discuss, whether these names are correct or not:

Sample 1: *Chaitophorus parvus* H.R.L., *Salix* sp. España: Boniches (Cuenca), 9.x.1974. G. REMAUDIERE & J.M. NIETO leg.; J.M. NIETO det.

- Sample 2: *Chaitophorus salijaponicus niger* MORDV., *Salix* sp. España: Alcañiz (Teruel), 5.viii.1985. J.M. NIETO y M.P. MIER leg.; M.P. MIER y V. SECO det. (published by MIER DURANTE *et al.*, 1989).
- Sample 3: *Chaitophorus salijaponicus niger* MORDV., *Salix purpurea* ssp. *lambertiana*. España: Hoces de Vegacervera (León), 30.vi.1986. G. REMAUDIERE & J.M. NIETO leg.; J.M. NIETO det.
- Sample 4: *Chaitophorus* sp aff. *mordvilkoï* MAMONT., *Salix purpurea* ssp. *lambertiana*. España: Berberino (León), 10.ix.1987. E.J. Tizado leg.; E.J. TIZADO det. (published by TIZADO MORALES, 1991).
- Sample 5: *Chaitophorus* sp aff. *mordvilkoï* MAMONT., *Salix purpurea* ssp. *lambertiana*. España: Berberino (León), 29.vii.1990. E.J. TIZADO leg.; E.J. TIZADO det.
- Sample 6: *Chaitophorus parvus* H.R.L., cotypes, *Salix ? repens*. Germania: Fukenhagen, 6.viii.1933. KORSCHESKY leg.; H.R.L. det.; BM 1984-340. (published by HILLE RIS LAMBERS, 1935).
- Sample 7: *Chaitophorus parvus* H.R.L., *Salix* sp. Norway: Nore, B, 9.viii.1974. STENSETH leg.; H.R.L. det.; BM 1984-340.
- Sample 8: *Chaitophorus parvus* H.R.L., *Salix lanata*. Norway: Skaber, 3.viii.1975. STENSETH leg.; H.R.L. det.; BM 1984-340.
- Sample 9: *Chaitophorus parvus* H.R.L., *Salix repens*. Denmark: Blokhus, 2.vii.1964. O. HEIE det.; BM 1984-340. (published by HEIE, 1982).
- Sample 10: *Chaitophorus mordvilkoï* MAMONT., BW/17, *Salix purpurea*. Austria: Plansee (Tirol), 5.ix.1956. H.L.G. STROYAN leg.; H.R.L. det.; BM 1982-492.
- Sample 11: *Chaitophorus ? mordvilkoï* MAMONT., FS/72, *Salix ? repens*. Italy: Ampezzo (Udine), 22.ix.1971. H.L.G. STROYAN leg.; H.L.G. STROYAN det.

HISTORICAL ACCOUNT

1) On *Chaitophorus parvus*

Ch. parvus was described by HILLE RIS LAMBERS (1935) and has been considered a good species by: BÖRNER (1952), who named it *Pseudomicrella parva*, SZELEGIEWICZ (1961, 1968 and 1978), HEIE (1970 and 1982), DANIELSSON (1974) and EASTOP & HILLE RIS LAMBERS (1976). However, HOLMAN & PINTERA (1977) and PINTERA (1987) considered it synonym of *Ch. salijaponicus niger*, without offering any further explanation.

HILLE RIS LAMBERS (1935) characterized this species fundamentally as having only 3 to 5 hairs on antennal segment III, by the siphunculi without reticulation and the absence of a membranous area around them, so that they are fused to the large, dark, sclerotic dorso-abdominal shield.

SZELEGIEWICZ (1961), in his text and figures, emphasized the absence of reticulation on the siphunculi, the short length of the processus terminalis of antennal segment VI, particularly in apterous specimens, the similar length of the two hairs at this segment, the cauda slightly constricted and the absence or scarcity of the membranous area around the siphunculi. In the key of apterous viviparous females, *Ch. parvus* appears with *Ch. niger* MORDVILKO, 1929; they are differentiated by: the ratios between the processus terminalis and the basal part of antennal segment VI (twice at most or at least, respectively); the number of hairs on antennal segment III (at most 6 and at least 7, respectively); the siphuncular ornamentation (lines and reticulum, respectively) and the shape and number of caudal hairs (not very knobbed with 4 or 5 hairs, or distinctly knobbed and with 6 or 7 hairs, respectively). From the data of the specimens measured, the host plant and the locations, it is evident that the only material of *Ch. parvus* that the author studied was the type material.

Some years later SZELEGIEWICZ (1968) included *Ch. parvus* in the aphidological catalogue of Poland, citing its presence in Poland and in Holland (probably as a result of the incorrect citation by BÖRNER, *op. cit.*). In spite of this, shortly afterwards SZELEGIEWICZ (1974) did not include it in the key of the Polish species of genus *Chaitophorus*.

HEIE (1982) gives prominence to many of the previously mentioned characters, and in his key of apterous viviparous females he sets it apart, due to the absence of siphuncular reticulation; although perhaps the Danish samples are *Ch. mordvilkoii* (see discussion).

To sum up, it is known in Poland at the type locality (its presence in this country was confirmed by SZELEGIEWICZ, 1961, 1968 and 1978), and Sweden (DANIELSSON, 1974). In each case it has been collected on *Salix repens* (= *rosmarinifolia*).

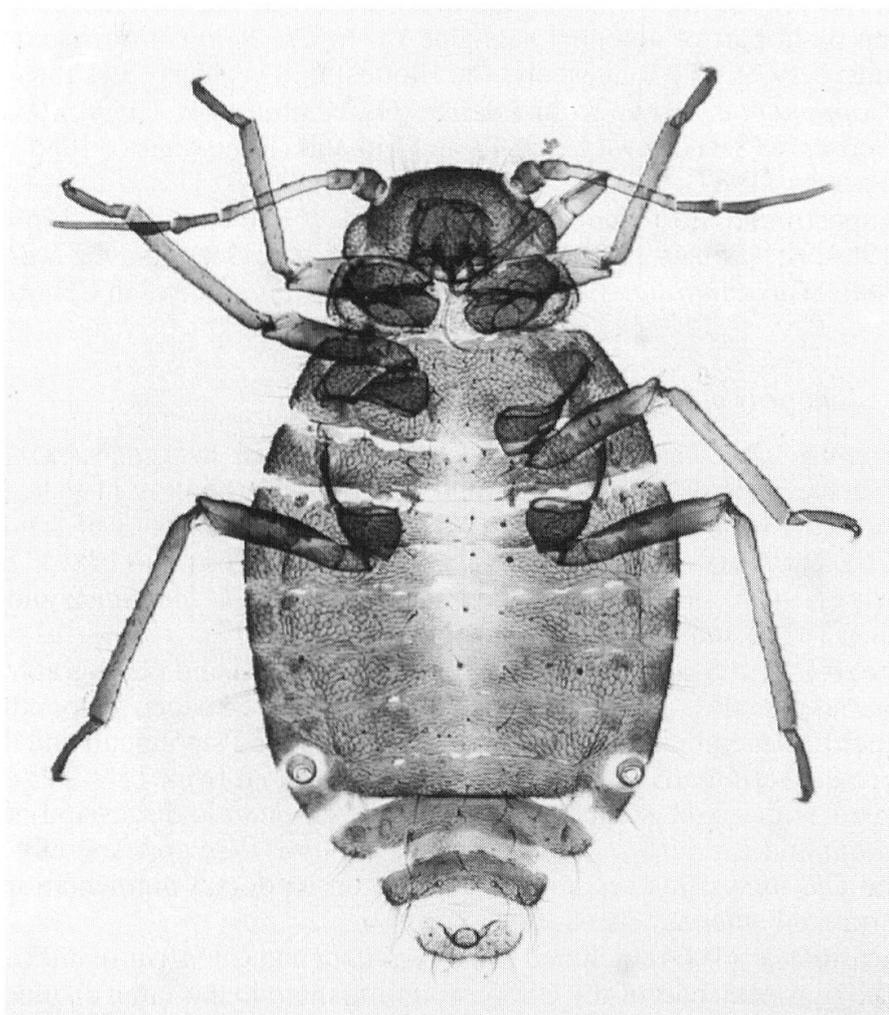


Fig. 1. *Chaitophorus parvus* H.R.L.

2) On *Chaitophorus lapponum*

Since its description by OSSINIANNILSSON (1959a), *Ch. lapponum* has been considered a good species by SZELEGIEWICZ (1964), EASTOP & HILLE RIS LAMBERS (1976), HEIE (1982), LAMPEL (1983), HEIKINHEIMO (1984) and PINTERA (1987); the last author, however, previously defined it (PINTERA, 1968) as a subspecies of *Ch. salijaponicus*.

OSSINIANNILSSON (1959a) characterized this species by its antennal hairs, the short processus terminalis and the presence of a membranous area around the siphunculi. He compares the new species with, among others, *Ch. niger*, differentiating them by the antennal hairs and by the processus terminalis, which is shorter in *Ch. lapponum*.

HEIE (1982), in his key for the apterous viviparous females, paired *Ch. lapponum* with *Ch. salijaponicus niger* in a brief disjunctive: whether the processus terminalis of antennal segment VI was longer (*Ch. salijaponicus niger*) or shorter (*Ch. lapponum*) than antennal segment III.

One of the characteristics by which PINTERA (1987) differentiated *Ch. lapponum* from the very similar *Ch. salijaponicus niger* was the different length of the hairs at the basal part of antennal segment VI. In *Ch. lapponum* these are shorter and the ratio between the longest and the shortest one is clearly less than 2.

Ch. lapponum is known from Sweden (OSSINIANNILSSON, 1959a, 1959b), Austria and Germany (SZELEGIEWICZ, 1964), and Finland (HEIKINHEIMO, 1984), all compiled by PINTERA (1987).

The spectrum of host plants is relatively wide (OSSINIANNILSSON, 1959b; SZELEGIEWICZ, 1964; HEIKINHEIMO, 1984 and PINTERA, 1987), in Scandinavia: *Salix glauca*, *S. lapponum*, *S. myrsinifolia*, *S. nigricans* and *S. phylicifolia*; and in Central Europe: *S. purpurea*.

3) *On Chaitophorus mordvilkoii*

Ch. mordvilkoii was described by MAMONTOVA in SZELEGIEWICZ, 1961 and treated as a species by TASHEV (1962 and 1963), SHAPOSHNIKOV (1964), HUCULAK (1965), PINTERA (1968), SZELEGIEWICZ (1964 and 1974), EASTOP & HILLE RIS LAMBERS (1976), STUDEMANN (1981), LAMPEL (1983) and PINTERA (1987). However, SZELEGIEWICZ (1968) considered it to be a subspecies of *Ch. lapponum* and HOLMAN & PINTERA (1981) a subspecies of *Ch. salijaponicus*.

MAMONTOVA in SZELEGIEWICZ, 1961, in the diagrams and photograph of apterous viviparous females, points out a pale spinal lozenge-shaped stripe, the almost total absence of a membranous area around the reticulated siphunculi and the length of the processus terminalis of antennal segment VI, about twice (1.9-2.2) as long as the basal part of the same segment. Although the taxonomic discussion is between *Ch. reticulata* and *Ch. vitellinae*, in the key *Ch. mordvilkoii* appears only with *Ch. parvus* and *Ch. niger*; this separation is based on its dorsal pigmentation and the tarsal, rostral and antennal chaetotaxy.

SHAPOSHNIKOV (1964) included *Ch. mordvilkoii* and *Ch. niger* in his key of aphids from the European part of the USSR, coupling them in the same disjunctive, and separating them by their dorsal and siphuncular pigmentation, and by the tarsal hairs.

In the key offered by SZELEGIEWICZ (1974), *Ch. mordvilkoii* is separated from *Ch. salijaponicus niger* because of the difference in dorsal pigmentation, in accordance with previous authors.

LAMPEL (1983), more precisely, offers characters which enable *Ch. mordvilkoii* to be differentiated from *Ch. lapponum*: the length of antennal segment III, the distance between the antennal insertions and the proportion between the processus terminalis of antennal segment VI and the antennal segment III.

Finally, PINTERA (1987) differentiates this species from *Ch. salijaponicus niger* by the different dorsal sclerotization, the lack of a membranous area around the siphunculi and by the spectrum of host plants, which is reduced to *S. purpurea*.

Its known distribution, from information by SZELEGIEWICZ (1961, 1964, 1968, 1974), TASHEV (1962, 1963), SHAPOSHNIKOV (1964), HUCULAK (1965), PINTERA (1968), HOLMAN & PINTERA (1981), STUDEMANN (1981), LAMPEL (1983) and PINTERA (1987) is: Poland, the former Soviet Union (the Ukraine, Trans-Caucasia and Central Asia), Bulgaria, Romania, France, Italy, Germany, Austria, Switzerland and, perhaps, Iran.

4) *On Chaitophorus salijaponicus niger*

Chaitophorus salijaponicus is morphologically a relatively variable species (PINTERA, 1987) which has been divided into four subspecies, two of them European: *Ch. salijaponicus niger* MORDVILKO, 1929, and *Ch. salijaponicus stroyani* PINTERA, 1987. The latter is known only in Italy on *Salix phylicipholia*, while *Ch. salijaponicus niger* has a very wide distribution and a larger spectrum of host plants, including *Salix repens* and *S. purpurea*.

5) *On the separation of these four taxa*

Taking into account that for some authors *Ch. parvus* is the same species as *Ch. salijaponicus niger*, and that the combinations *Ch. salijaponicus lapponum*, *Ch. salijaponicus mordvilko* and *Ch. lapponum mordvilko* have been given, it is clear that there is a great difficulty in effecting correct separation of these taxa.

The latest contribution, within a revision of the Palearctic species of the genus *Chaitophorus*, is that of PINTERA (1987), who in his key resolves the division of apterous viviparous females as follows:

- 44 (45) Basal half of last rostral segment with 3-6, more frequently with 4 hairs. Femora and knees of all legs dusky. Shape of body broadly oval. On *Salix* spp. *Ch. lapponum*
 45 (44) Basal half of last rostral segment frequently with 2 hairs, but exceptionally with 3 or even 4 hairs. Femora and knees of fore and middle legs pale. Shape of body prolonged oval.
 46 (47) First segment of hind tarsi with 7 hairs; only exceptionally with 5 hairs, but in this case siphunculi completely fused with dark dorsal shield and microstructure is well visible. Tergum in apterae blackish, but always with distinct pale median stripe at least on anterior half of body. On *Salix purpurea*. *Ch. mordvilko*
 47 (46) First segment of hind tarsi usually with 5 hairs; sometimes with 7 hairs, but in this case the longest hair on basal part of last antennal segment at least twice as long as the shortest hair. Tergum in apterae blackish, usually without distinct pale median stripe.
*Ch. salijaponicus* s. lat. [including *Ch. parvus*]

One fundamental character in the separation of *Ch. mordvilko* and *Ch. salijaponicus* is the fusion of the siphunculi with the dorsal shield, which he considers exclusive to the former. However, in the cotypes and the description of *Ch. parvus* the existence of this fusion is noted; moreover, PINTERA (1987) also describes a subspecies of *Ch. salijaponicus* with siphunculi fused to the shield, so that this character does not resolve the disjunctive clearly. In our opinion, it should be considered as a variable character (subspecific perhaps) within the different species in which it can appear.

In the same way, we consider that the presence of a pale median dorsal stripe is of little value in the division since, as PINTERA (1987) accepts, it can be seen in *Ch. salijaponicus salijaponicus*, and we have also observed it in *Ch. salijaponicus niger*.

Finally, the only new contribution to the separation of these species is the different colour of the femora and the knees of fore and middle legs with respect to the hind legs. This character, as we have been able to prove with Spanish specimens of *Ch. parvus* and *Ch. salijaponicus niger* is very variable according to the general pigmentation of the specimen. As a result of this and of the synonymisation of *Ch. parvus*, the determination of specimens using these characters is rather unsure.

RESULTS AND DISCUSSION

Characterization of Chaitophorus salijaponicus niger

Chaitophorus salijaponicus niger can be characterized morphologically with respect to the species under discussion here with reference to the Spanish material and coinciding with all the authors by: 1) the fusion of tergites II-VI into a large dorsal shield, with uniform pigmentation or with a pale central stripe, leaving a membranous area around the siphunculi; 2) very dark or black, cylindrical-shaped siphunculi, always showing a reticulation.

All the authors who have given measurement of this subspecies (Tab. 1) coincide in: 1) processus terminalis of antennal segment VI at least 2.1 times the length of basal part of the same segment; 2) processus terminalis 0.9-1.2 times the length of antennal segment III; 3) long hairs, in proportion to the basal diameter of antennal segment III: the longest hair on antennal segment III 3.2-5.8 times, dorsal hairs on the abdomen 6-8 times, and the longest hair on antennal segment VI 2.2-4.2 times; the last of these is at least 1.5 times the shortest hair on the same segment; 4) apical rostral segment with 2-4 complementary hairs and 0.8-1.1 times the second segment of hind tarsus.

Taxonomic discussion of Chaitophorus parvus

The study of the cotypes (sample 6 of Tab. 1), of Spanish material (samples 1-5 of Tab. 1; Fig. 1) and bibliographical revision (HILLE RIS LAMBERS, 1935; SZEL-EGIEWICZ, 1961; HEIE, 1982 and sample 9) allow *Ch. parvus* to be characterized morphologically by: 1) tergites II-VI fused into a large pigmented dorsal shield, sometimes with small intersegmentary marginal and pleural membranous incisions, as well as a membranous area around the siphunculi, although generally the siphunculi are fused to the shield; 2) siphunculi in the shape of truncated cones, darkish and without clear reticulation, with only transverse lines.

The most important morphometrical characters are: 1) short processus terminalis, bibliographical data show it never superior to 2.1 times the length of the basis while in the cotypes this proportion has a maximum of 2.2; 2) short hairs, in proportion to the basal diameter of antennal segment III: the longest one on antennal segment III less than 2.9 times, the dorsal abdominal hairs less than 5.0 times, and the longest hair at antennal segment VI at most 1.5 times; the two hairs at basal part of antennal segment VI approximately of the same length in the cotypes but up to 2.0 in Spanish material. Moreover, although overlapping with *Ch. salijaponicus niger*, 3) processus terminalis 0.7-1.0 times antennal segment III, and 4) apical rostral segment with 2-4(-5) complementary hairs and 0.9-1.1 times the second segment of hind tarsus.

It should be pointed out that the data of HEIE (1982), taking into account the sample 9 of the HEIE's collection, suggest that the species described by him as *Ch.*

Tab. 1. Measurements (in mm) and ratios of *Chaitophorus salijaponicus niger*, *Ch. parvus*, *Ch. lapponum* and *Ch. mordvilkoii* from bibliographical and original data (samples 1 to 11, see Material studied). Bold numbers mean average values.

	C	Vlpt/Vlb	M/m	sIII/ØIII	M/ØIII	IV/Vlb	SIII	sr	u3/ØIII	Vlpt/III
<i>Ch. salijaponicus niger</i>										
from SZELEGIEWICZ	1.2-1.8	2.1-3.0	-	-	-	1.1-1.4	4-5	4	-	-
from PINTERA	1.2-2.3	2.1-2.8	1.5-3.7	3.2-5.4	2.2-4.2	0.9-1.5	5-12	2(-4)	-	-
from HEIE	1.2-2.2	2.1-3.0	-	4.0-5.0	-	-	7-11	2(-4)	6-8	> 1
from LAMPEL	1.4-1.8	2.5-3.4	-	3.5-5.8	-	-	6-13	2-4	-	0.9-1.2
<i>Ch. parvus</i>										
original description	-	2	-	-	-	1.0	-	-	-	-
sample 6 (cotypes)	1.2-1.52	2.1-2.2	1.0	1.8-2.6	0.8	0.9-1.2	3-5	2	4.6-4.7	0.9-1.0
from SZELEGIEWICZ	1.27	2	-	? 4.5	-	1.0	4-6	4	-	-
<i>Ch. lapponum</i>										
original description	2	< niger	-	-	-	1.2-1.9	? 1-3	4-6	-	-
from HEIE	1.5-1.8	1.8-2.4	-	-	-	-	8	4-6	-	-
from LAMPEL	1.9-2.0	1.86	-	-	-	1.55	-	-	-	0.7-0.9
from PINTERA	1.8-2.3	1.5-2.4	1.0-1.7	2.7-4.0	1.3-2.2	1.2-1.6	5-10	3-5	-	-
<i>Ch. mordvilkoii</i>										
original description	1.6-1.9	1.9-2.2	-	2.2-3.7	-	1.1-1.4	6-11	2	-	-
from LAMPEL	1.4-1.6	1.6-2.2	-	1.8-3.2	-	1.24	3-6	2	-	0.9-1.2
from PINTERA	1.2-2.1	1.6-2.3	1-1.5	2.2-4.0	1.5-2.3	1.3-1.4	3-12	2	4-8	-
Identified by authors										
<i>Ch. parvus</i> (sample 1)	1.2-1.4	1.4-1.7	1.0-1.8	1.3-2.1	0.9-1.3	1.0-1.3	3-7	2-3(-4)	2.0-4.0	0.8-1.0
<i>Ch. parvus</i> (sample 2)	1.4-1.5	1.3-1.4	1.5-2.0	1.5-2.4	1.0-1.4	0.9-1.1	4(-6)	2	2.5-3.3	0.7-0.9
<i>Ch. parvus</i> (samples 3-5)	1.2-1.8	1.7-2.0	1.3-2.0	2.4-2.9	1.0-1.5	0.7-1.1	6-8	2-3(-5)	2.9-5.0	0.9-1.0
<i>Ch. lapponum</i> (sample 7)	1.7-2.0	1.5-1.8	1.5-1.8	2.5-3.6	1.6-1.8	1.2-1.5	4-7	3-4	5.9-6.4	0.7-0.8
<i>Ch. lapponum</i> (sample 8)	1.6-1.9	1.8-1.9	1.3-1.4	3.5-3.6	1.7-2.0	1.3-1.4	8-11	2-4	5.0-6.1	0.8-0.9
<i>Ch. mordvilkoii</i> (sample 9)	1.3-1.5	1.8-2.0	1.0-1.4	3.5-3.8	2.3-3.1	0.9-1.1	4-5	4	6.7-7.0	0.9-1.1
<i>Ch. mordvilkoii</i> (sample 10)	1.3-1.4	1.6-2.0	1.4-1.8	2.6-3.5	1.8-2.5	1.0-1.2	3-5	2-4	4.4-5.0	1.0-1.3
<i>Ch. mordvilkoii</i> (sample 11)	1.4	1.7-2.0	1.3-1.4	2.5-3.3	1.75	1.1-1.2	3-5	2	5.0-5.3	1.1-1.2
Abbreviations: III, IV= antennal segment; Vlpt= processus terminalis; Vlb= basal part of antennal segment VI. Hair of basal part of antennal segment VI: M= the longest one; m=the shortest one. Length of: sIII=the longest hair of antennal segment III; C= body length; u3= dorsal hairs on abdominal tergite 3. ØIII= Diameter of antennal segment III. Number of hairs: SIII= on antennal segment III; sr= on basal half of rostral apical segment.										

parvus is really *Ch. mordvilkoii*; and SZELEGIEWICZ (1961) gives a value of 4.5 for the proportion between the length of the longest hair on antennal segment III and basal diameter of the same segment, but considering that in the cotypes measured by us the highest value is 2.6 and that he only gives measurements of one specimen, we prefer to omit this data.

Taking the siphunculi (no reticulation), the ratio processus terminalis/basal diameter of antennal segment III and the length of the hairs, we are of the opinion that there is no synonymy between *Ch. parvus* and *Ch. salijaponicus niger*, as proposed by HOLMAN & PINTERA (1977) and reiterated by PINTERA (1987). *Chaitophorus parvus* HILLE RIS LAMBERS, 1935, is a valid name. Then, with reference to the above list, the labels on slides of the samples 2 to 5 were incorrect and refer to the species *Ch. parvus*; a species that can also live on *Salix purpurea*.

Taxonomic discussion of Ch. lapponum and Ch. mordvilkoï

The differentiation between the other two species studied (*Ch. lapponum* and *Ch. mordvilkoï*) and the differentiation between them and *Ch. parvus* is still more complicated.

LAMPEL (1983) differentiates both species by the length of antennal segment III and by the distance between the antennal insertions, which are smaller in *Ch. mordvilkoï*, although this could be due to the fact that the specimens of this species measured were smaller than those of *Ch. lapponum*. He also differentiates them by the ratio between the processus terminalis and antennal segment III, which is between (0.82-) 0.94-1.23 times in *Ch. mordvilkoï* and between 0.67-0.88 (-0.95) times in *Ch. lapponum*.

The analysis of other morphological and morphometrical data does not permit a clear differentiation between both taxa, except by characters such as dorsal pigmentation, the membranous area around the siphunculi and the number of complementary hairs on the apical rostral segment. Therefore, following the criterion already expressed by SZELEGIEWICZ (1968), we believe that *Ch. mordvilkoï* could be considered a subspecies of *Ch. lapponum*, although to ensure this, the types of both taxa would have to be examined.

The morphological data of the two taxa appear in Tab. 1. *Ch. lapponum* s.lat. can be separated from the previous species by the following characters together, although there is overlapping when they are considered one by one: the length of the hairs in proportion to the basal diameter of antennal segment III: the longest hair on antennal segment III 2.2-4.0 times, the dorsal hairs on the abdomen at least 4 times and the longest hair at antennal segment VI 1.3-2.3 times; also, the ratio of the two hairs at antennal segment VI between 1.0-1.7 times.

Specimens of the samples 7 and 8, originally called *Ch. parvus* (from Norway), show the morphological characters of *Ch. lapponum lapponum*; samples 9 to 11 (from Denmark, Austria and Italy), however, show those of *Ch. lapponum mordvilkoï*.

It could be considered that *Ch. lapponum* s.lat. presents a European distribution with a North-South differentiation in subspecies; thus, *Ch. lapponum lapponum* is found in the North of Europe (Finland, Sweden and Norway) on numerous species of *Salix*, and in Central Europe perhaps only on *Salix purpurea* (Austria and Germany), while *Ch. lapponum mordvilkoï* is found on *Salix purpurea* and *S. repens* in Central and Southern Europe (Germany, Bulgaria, France, Italy, Poland, Romania and the former USSR, perhaps also in Denmark).

Key for the apterous viviparous females

The separation of the mentioned species and subspecies has to be based principally on morphometrical characters, in particular on the length of the hairs, while the morphological characters are of secondary importance, given their variability. For example: 1) the complete or almost complete fusion of the siphunculi to the dorsal shield is generally present in *Ch. parvus*, *Ch. lapponum mordvilkoï* and *Ch. salijaponicus stroyani*; 2) the large discal shield may appear more or less divided into segments and may show a paler median stripe in *Ch. lapponum mordvilkoï*, *Ch. salijaponicus niger* and *Ch. parvus*; 3) the tarsal hairs, 5 to 7.

The separation of the taxa considered can in most cases be made using the following key (the abbreviations are those used in Tab. 1):

1. VIpt/VIb > 2.1 and M/ØIII > 2.2 and M/m >1.5 *Ch. salijaponicus niger*
- 1' Do not show all these characters 2
2. M/ØIII 0.8-1.5; sr 2-4 *Ch. parvus*
- 2' M/ØIII (1.3?-)1.5-2.5(-3.1); sr 2-6 *Ch. lapponum* s.lat. ... 3
3. VIpt/III 0.67-0.88(-0.95); sr (2-)4-6. Typically with a membranous area around the siphunculi *Ch. lapponum* or *Ch. lapponum lapponum*
- 3' VIpt/III (0.82-)0.94-1.3; sr 2-4. Typically with the siphunculi fused to the shield *Ch. mordvilkoï* or *Ch. lapponum mordvilkoï*

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RÉSUMÉ

Il existe des problèmes taxonomiques pour effectuer l'identification de *Chaitophorus salijaponicus niger* MORDVILKO, 1929, *Ch. parvus* HILLE RIS LAMBERS, 1935, *Ch. lapponum* OSSIANNILSSON, 1959 et *Ch. mordvilkoï* MAMONTOVA in SZELEGIEWICZ, 1961. Nous avons considéré toutes les données antérieures de plusieurs chercheurs sur les caractéristiques morphologiques et la différenciation spécifique de ces espèces et nous avons étudié des pucerons ramassés dans plusieurs pays d'Europe. De nos études, on peut conclure que *Ch. salijaponicus niger* et *Ch. parvus* sont de bonnes espèces, et que la synonymie proposée entre elles par HOLMAN & PINTERA (1977) et PINTERA (1987) n'est pas valable. Nous avons fait un étude biométrique et quelques considérations biologiques sur la position taxonomique de *Ch. lapponum* et *Ch. mordvilkoï*. Cette dernière espèce peut être une sous-espèce de *Ch. lapponum*. Nous avons préparé, finalement, une clé dichotomique pour l'identification de ces taxons.

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