

Two new species of *Sappaphis* Mats. (Homopt., Aphid.)

by

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Sappaphis maritima nov. spec.

APTEROUS VIVIPAROUS FEMALE.

Morphological characters. Body broadly pyriform, rather swollen. Tergum conspicuously reticulated, head faintly brownish and ventrally and frontally conspicuously scabrous by minute spinules, dorsally slightly rough; small brown pleural intersegmental sclerites present; small smoky sclerotic areas around the spinal tubercles present; rest of the body completely membraneous and not pigmented. Dorsal hairs on IIIrd abd. tergite hardly longer than the hairs on IIIrd ant. segment; VIIIth abd. tergite with 4 somewhat longer, subacute hairs. Very small, faintly brownish marginal tubercles present on pronotum and abd. segments I—IV, sometimes also more caudad. Small spinal tubercles nearly always present on VIIth and VIIIth abd. tergite, exceptionally one on other segments. Front with a broad, conspicuous median tubercle and low, rather angular antenniferous tubercles. Antennae pigmented like the head, with blackish apex, conspicuously imbricated, about $\frac{5}{9}$ — $\frac{3}{4}$ length of body; processus terminalis only 2—3 times as long as base of VIth segment, shorter than IIIrd segment; base of VIth segment more than half as long as Vth segment. Hairs on IIIrd ant. segment very short and blunt, without their bases less than $\frac{1}{3}$ of the diameter of the segment at its constricted base. Rostrum rather long, reaching past the hind coxae; apical segment $1\frac{2}{5}$ — $1\frac{1}{2}$ times 2nd joint of hind tarsi, with the usually 4 hairs on basal half considerably shorter than the longest of the 3 pairs near apex. Siphunculi usually sinuated, curved inwards and near apex slightly outwards, sometimes straight, pale with dark to blackish very apex, coarsely imbricated from base to the dark apical part, which is mostly quite smooth, annularly constricted just below the wide flange and there with several transverse striae, $\frac{1}{7}$ — $\frac{2}{11}$ length of body. Cauda pale, triangular with convex sides, rather acute, rarely longer than its basal width, with normally 5 strongly curved hairs, just less than $\frac{1}{3}$ of the length of the siphunculi. Subanal plate with a more or less distinct subacute apex directed downwards. Legs evenly pale, the tarsi hardly darker; femora dorsally imbricated; first tarsal joints with 3, 3, 2 hairs.

Colour. Lead-coloured to somewhat brownish, ventrally greyish by wax-powder, dorsally dull but not powdered. Siphunculi and antennae almost colourless with dark apices.

Measurements in mm.

No.	Length body	Ant.	Siph.	Cau.	Ant. segments			
					III	IV	V	VI
1	1.80	1.40	0.31	0.09	0.35	0.26	0.19	(0.11 + 0.32)
2	1.90	1.34	0.32	0.09	0.39	0.22	0.17	(0.11 + 0.30)
3	1.87	1.09	0.28	0.09	0.30	0.15	0.13	(0.10 + 0.26)
4	2.05	1.29	0.30	0.10	0.35	0.22	0.18	(0.11 + 0.28)
5	1.92	1.41	0.33	0.11	0.39	0.24	0.21	(0.13 + 0.28)
6	1.81	1.38	0.32	0.10	0.37	0.23	0.21	(0.13 + 0.29)

(1—2, Bergen op Zoom, 17.VII.'53; 3, idem, VIII.'40; 4, Boschplaat-Terschelling, 19.VIII.'46, leg. Zool. Lab. Utrecht; 5—6, Wolphaartsdijk, 22.VI.'50, leg. Miss M. TAZELAAR).

ALATE VIVIPAROUS FEMALE.

Morphological characters. Head and thorax black sclerotic. Abdomen with rather large marginal and postsiphuncular sclerites and with broad blackish spino-pleural transverse bars from IIIrd-VIIIth abd. tergite; from IIIrd to VIth abd. tergite these bars coalesce more or less completely to form a large central sclerite with between III/IV and V/VI intersegmental perforations. Tubercles arranged as in apterae viviparae, but rather frequently with the membranous part subdivided and resembling groups of wax-glands. Dorsal hairs slightly longer. Head apparently smooth. Antennae blackish brown with the very base of IIIrd segment just paler; IIIrd segment with about 26—33 slightly protruding rhinaria over most of the surface; IVth with 6—9 more or less in a row; Vth with 0—4 secondary rhinaria. Siphunculi blackish, more cylindrical, rather smooth, about $1/8$ — $1/7$ length of body. Cauda darkish, with almost straight sides. Legs brownish yellow with most of the femora distally dark to blackish brown and with dark apices to the tibiae. Wings apparently rather often with the media only once forked. Other characters as in apterous viviparous female.

Colour. Seemingly black, but the membranous parts of abdomen dirty dark greenish. Ventrally slightly dusky.

Measurements in mm.

No.	Length body	Ant.	Siph.	Cau.	Rhin. on segment			Ant. segments			
					III	IV	V	III	IV	V	VI
1	1.87	1.63	0.25	0.10	29 & 32	9 & 9	4 & 3	0.49	0.28	0.23	(0.15 + 0.33)
2	1.96	1.57	0.23	0.10	27 & 30	8 & 7	3 & 0	0.47	0.26	0.23	(0.14 + 0.33)
3	2.00	1.75	0.30	0.11	32 & 33	6 & 6	1 & 1	0.54	0.31	0.26	(0.15 + 0.34)

(1—3, Wolphaartsdijk, 25.IX.'50, leg. Miss M. TAZELAAR).

OVIPAROUS FEMALE.

Morphological characters. Very much like apterous viviparous female, but VIIIth abd. tergite usually with 6 hairs and subgenital plate with many hairs on its anterior half. Hind tibiae pigmented like the other tibiae, slightly incrassate and over most of their length with about 20—35 pseudosensoria.

Colour as in apterous viviparous female.

Measurements in mm.

No.	Length body	Ant.	Siph.	Cau.	Ant. segments			VI
					III	IV	V	
1	2.04	1.24	0.28	0.09	0.32	0.19	0.17	(0.12 + 0.28)
2	1.96	1.26	0.27	0.10	0.33	0.19	0.19	(0.12 + 0.27)
3	2.13	1.27	0.29	0.10	0.32	0.19	0.19	(0.12 + 0.30)

(1—3, Wolphaartsdijk, 2.X.'50, leg. Miss M. TAZELAAR).

ALATE MALE.

Morphological characters. Much like alate female, but smaller and more slender. Central abdominal sclerite rather broken up, strongly perforated. Antennae about as long as body; IIIrd segment with about 38—41 rhinaria, IVth with 9—10, Vth with 5—6 secondary rhinaria. Siphunculi and cauda both more slender than in alate female.

Measurements in mm.

No.	Length body	Ant.	Siph.	Cau.	Rhin on segment			Ant. segments			VI
					III	IV	V	III	IV	V	
1	1.55	1.57	0.20	0.07	38 & 41	9 & 10	5 & 5	0.49	0.27	0.24	(0.13 + 0.30)
2	1.70	1.71	0.22	0.09	38 & 40	9 & 10	6 & 6	0.52	0.30	0.28	(0.13 + 0.33)

(1—2, Wolphaartsdijk, 2.X.'50, leg. Miss M. TAZELAAR).

Host plant: *Plantago maritima*.

Localities: Wolphaartsdijk, Wilhelminadorp, Bergen op Zoom, Terschelling, Oostmahorn, Usquert; evidently common along the coast on the zone below the *Artemisietum maritimae*.

Notes. One finds this species living on the upper- or undersides of the leaves, on the bases, near or in the soil. Sometimes it is attended by *Lasius niger* and then it lives partly underground. I found the aphid wherever I examined its hostplants. The species does not migrate, but part of the gynoparae are alate as in migratory species. In cultures oviparae and males were obtained in the end of September.

As several halophilous aphids differ from nearly related nonhalophilous species by shorter antennae, notably by a shorter processus terminalis, this species was chosen to investigate whether perhaps the short antennae were a modification induced by the high salt-contents of the hostplant.

Therefore the species was reared for a year on *Plantago maritima* watered with sea-water, and on *Plantago lanceolata* growing in poor sandy soil, watered with tap-water. We could not find any difference between the aphids from the two plants. Evidently the salt contents of the plant has no direct influence on the morphological structure of this species.

Morphologically the species is closest related to the summerforms of *Sappaphis aucupariae* (Buckt.) on *Plantago* spp., the differences being very small. Both alatae and apterae of *maritima* differ from comparable forms of *aucupariae* by a longer basal part of the VIth antennal segment; in *aucupariae* the processus terminalis is comparatively longer, usually more than 3 times as long as the basal part of VIth antennal segment. Alatae of *aucupariae* have many more rhinaria on the IIIrd, IVth and Vth antennal segment.

Material from Terschelling, collected 19.VIII.'46 in the *Artemisietum maritimae* differs from the other samples by having a non-reticulated tergum, a shorter rostrum and by the presence of conspicuous granulated pleural intersegmental sclerites. This form is named here *Sappaphis maritima* subspec. *glabra* nov. subspec.

Types in the author's collection.

Sappaphis gallica nov. spec.

APTEROUS VIVIPAROUS FEMALE.

Morphological characters. Body broadly pyriform, swollen. Tergum usually distinctly reticulated; head faintly pigmented, frontally and ventrally scabrous, dorsally faintly dispersely scabrous, especially near the antennal bases; pleural intersegmental sclerites on abdomen small, sharply bordered, brownish yellow. Spinal hairs of IIIrd abdominal tergite as long as the hairs on IIIrd anten-

nal segment, hairs on VIIIth abdominal tergite $1\frac{1}{2}$ —4 times longer, all very blunt. Very small marginal tubercles present on pronotum and abdominal segments I—IV; similar spinal tubercles present on VIIIth abdominal tergite, more rarely also on VIIth abdominal tergite. Front with a pronounced, rather conical median tubercle and rather well developed, diverging, angular antenniferous tubercles. Antennae pigmented like the head, with darker apex, $\frac{4}{5}$ —1 times body's length, conspicuously imbricated; processus terminalis about as long as IIIrd segment, about $3\frac{1}{2}$ — $4\frac{1}{2}$ times base of VIth segment. Hairs on IIIrd antennal segment about $\frac{1}{4}$ of the diameter of the segment at its slightly constricted base. Rostrum just reaching the hind coxae; apical segment slender, slightly over $1\frac{1}{2}$ times as long as 2nd joint of hind tarsi, with on basal half 4 hairs about as long as four of the six near apex, and sometimes with 1—2 additional, shorter hairs. Siphunculi variable in shape, gradually tapering till about their middle with cylindrical distal half, to evenly tapering till apex, usually curved inwards, pale with dark apex, imbricated, more smooth towards apex, $\frac{1}{6}$ — $\frac{1}{5}$ length of body. Cauda pale, triangular, rather variable in shape, rather acute, $\frac{1}{4}$ — $\frac{1}{3}$ of the siphunculi, with 5 curved hairs. Legs usually evenly pale; femora imbricated; first tarsal joints with 3, 3, 2 hairs.

Colour. Lead-grey to almost blackish, dorsally dull, ventrally slightly grey by wax-powder. Antennae, legs and siphunculi almost colourless, the last with the very apices dark.

Measurements in mm.

No.	Length body	Ant.	Siph.	Cau.	Antennal segments			
					III	IV	V	VI
1	2.15	1.86	0.35	0.12	0.52	0.35	0.23	0.11 + 0.47
2	2.16	1.87	0.35	0.12	0.51	0.35	0.24	0.13 + 0.48
3	2.13	1.75	0.35	0.14	0.50	0.35	0.21	0.12 + 0.43
4	1.90	1.57	0.35	0.11	0.45	0.28	0.18	0.11 + 0.42
5	1.57	1.47	0.28	0.10	0.40	0.24	0.18	0.10 + 0.42
6	1.73	1.56	0.33	0.10	0.43	0.26	0.20	0.11 + 0.43
7	1.74	1.69	0.35	0.11	0.46	0.30	0.20	0.11 + 0.47
8	1.68	1.60	0.33	0.10	0.45	0.28	0.20	0.12 + 0.42
9	1.96	1.86	0.36	0.11	0.54	0.33	0.23	0.12 + 0.48
10	1.96	?	0.37	0.12	0.46	0.31	0.20	0.11 + ?
11	2.09	1.74	0.34	0.13	0.49	0.33	0.24	0.11 + 0.43
12	1.66	1.57	0.32	0.13	0.42	0.31	0.20	0.11 + 0.39
13	1.53	1.44	0.30	0.10	0.39	0.26	0.18	0.11 + 0.39
14	1.69	1.63	0.34	0.11	0.44	0.29	0.22	0.11 + 0.43

(1—3, *Antirrhinum majus*, Beth-Hakerem, Israel, 10.IV.'46, leg. I. SWIRSKI; 4—8, *Linaria cymbalaria*, Paris, France, Jardin des Plantes, IX.'52, leg. H.R.L.; 9—10, *L. cymbalaria*, Schaffhausen, Switzerland, 30.IX.'53, leg. W. MEIER; 11—12, *L. cymbalaria*, Cambridge, England, 24.XII.'52, leg. STROYAN; 13—14, *L. cymbalaria*, Bettws-y-coed, Wales, 28.VII.'54, leg. STROYAN).

ALATE VIVIPAROUS FEMALE.

Morphological characters. Head and thorax black sclerotic; abdomen membranous, with rather large marginal sclerites and a large, also laterally rather straight central sclerite from anterior margin of IIIrd tergite to the spinal hairs of Vth tergite; this sclerite usually is somewhat perforated between tergites III and IV and it almost always has a wide transverse slit between tergites V and

VI; postsiphuncular sclerites large, only ventrally connected with a sclerotic bar across VIIIth sclerite; VIIIth tergite with a paler transverse bar. Antennae blackish, about as long as body; IIIrd segment with about 52—75 rather large, mostly transversely oval, somewhat tuberculate rhinaria on about $\frac{3}{5}$ of its circumference; IVth segment with about 17—32 rhinaria; Vth segment with 2—7 rhinaria mainly on basal $\frac{2}{3}$ part, more rarely without rhinaria; processus terminalis about $\frac{3}{4}$ of IIIrd segment, about $3\frac{3}{4}$ — $4\frac{1}{2}$ times base of VIth segment. Siphunculi almost smooth, cylindrical with dilated base, blackish, about $\frac{1}{7}$ length of body, with wide flange. Cauda dark. Legs with the femora pale, blackish towards apex; tibiae with the very base and the apical parts dark. Other characters more or less as in apterous viviparous female.

Colour. Head, thorax, antennae, siphunculi, cauda and the sclerotic parts of abdomen blackish, the rest very dark green.

Measurements in mm.

No.	Length body	Ant.	Siph.	Cau.	Rhin. on			Ant. segments			
					III	IV	V	III	IV	V	VI
1	1.98	1.94	0.28	0.10	55 & 56	21 & 21	3 & 5	0.61	0.34	0.23	0.12 + 0.49
2	1.96	2.00	0.26	0.10	56 & 61	23 & 20	3 & 5	0.62	0.36	0.23	0.12 + 0.51
3	1.96	1.97	0.28	0.10	73 & 74	31 & 27	4 & 7	0.64	0.37	0.23	0.12 + 0.46
4	1.86	1.90	0.26	0.09	57 & 59	24 & 24	3 & 3	0.62	0.35	0.21	0.12 + 0.45

(1—2, Paris, France, IX.'52, leg. H.R.L.; 3, Schaffhausen, Switzerland, 30.IX.'53, leg. W. MEIER; 4, Lugano, Switzerland, 25.IX.'53, leg. W. MEIER; all from *Linaria cymbalaria*).

ALATE MALE.

Morphological characters. Like the preceding form, but smaller and more slender. Abdominal central sclerite deeply incised laterally on the middle of each segment, the part on IIIrd abdominal tergite even cut off from the rest, also with median perforations. Antennae longer than body; IIIrd segment with about 55—90 rhinaria, IVth with about 19—25, Vth with 4—8. Siphunculi only just thicker than the hind tibiae. Genitalia normal.

Colour. As in the preceding form but abdomen in alcohol mottled reddish brown.

Measurements of one specimen: Length of body: 1.61 mm,

ant.: 1.97 mm; siph.: 0.23 mm; cau.: 0.09 mm. Ant. segments: $\frac{0.56}{III}$; $\frac{0.36}{VI}$; $\frac{0.24}{V}$; 0.12 + 0.53 mm. Rhin. on IIIrd ant. segment: 71 & 88; on IVth: 25 & 24; on VI

Vth: 7 & 5 (*Linaria cymbalaria*, Paris, France, IX—'52, leg. H.R.L.).

Host plants: *Antirrhinum majus*, *Linaria cymbalaria*.

Localities: Beth-Hakerem (Israel), Paris (France), Lugano, Schaffhausen (Switzerland), Cambridge (England), Bettws-y-coed (Wales).

Notes. Material was first received from Israel and it was identified as questionably *S. mali* (Ferr.). A few specimens received from Dr REMAUDIÈRE, collected in France, also could not be separated from *mali*. In the autumn of 1952 I found large colonies in the Jardin des Plantes in Paris. From these a culture was started. The apterae refused to feed on *Plantago*, the secondary hostplant of *S. mali*. Alatae developed on *Linaria cymbalaria* could not be induced to produce

offspring on that plant, but they also refused to do so on leaves of *Sorbus aucuparia*, *S. torminalis*, *S. aria*, *Pirus malus*, *P. communis*, *Crataegus monogyna* and *Crataegus coccinea*. They showed more interest in leaves of *Amelanchier* and produced some larvae on *A. ovalis*. The larvae, however, died. From all this it was evident, that the species was not identical with *S. mali* (Ferr.).

Apparently the absolute lengths of the last rostral segment, the hind tarsi and the base of VIth ant. segment are about 10% greater than those of the corresponding parts of *S. mali*, but the siphunculi in *S. gallica* are about 12% shorter, though there is considerable overlapping. The only rather consistent difference in apterae of both species is $\frac{\text{diameter of the siphunculi in the middle.}}{\text{length of the siphunculi}}$. This quotient

for *S. mali*, reared on *Plantago*, is 7.44—11.60, but in *gallica* 5.00—7.29. One small specimen from *Plantago*, collected at Bennekom, has a quotient of 7.14, so that also this difference is not completely reliable.

Similar obstacles are encountered when one tries to separate the other *Sappaphis* species living on *Plantago* (*S. aucupariae* Buckt., *S. mali* Ferr., *S. plantaginea* Pass. sensu BÖRNER (1952), *S. maritima* nov. spec.). Therefore BÖRNER's bold step of identifying a species discovered by him on *Sorbus torminalis* and *Plantago* with *Myzus plantagineus* Pass., 1860 is less justified than my older suggestion that *plantagineus* Pass. is the common Rosy Apple Aphid. For BÖRNER's apterae do not show the dark apices to the siphunculi which PASSERINI describes. In most *Sappaphis* from *Plantago* the antennae in apterae are longer than the body in living specimens or specimens mounted as PASSERINI did. In the same way the siphunculi extend past the cauda as long as the specimens are not inflated by mounting, but when they are cleared (KOH, chloralphenol), even in BÖRNER's "*plantaginea*" the siphunculi do not reach the cauda. Young adult apterae of the Rosy Apple Aphid on *Plantago* are quite the colour which PASSERINI described for his *plantaginea*. Consequently the name *S. mali* Ferr., which certainly is the Rosy Apple Aphid, need not be preferred above the older name *S. plantaginea* Pass., 1860.

It is not excluded, that *S. gallica* nov.spec. is part of the cyclus of *S. parasorbi* Börner, 1952, from *Amelanchier ovalis*, of which the further biology is not known.

It is probably this species which BÖRNER (1952, p. 231) records as *Sappaphis linariae* Lichtenstein, suggesting that it might be the same as *Aphis cymbalariae* Schouteden. SCHOUTEDEN describes a quite different insect and LICHTENSTEIN never described his species, but only mentioned it as *Aphis linariae* from *Linaria* sp. This could just as well refer to *Brachycaudus linariae* Stroyan or any other aphid occurring on *Linaria* spp.

Cotypes in the author's collection, in the Brit. Mus. (Nat. Hist.), London and in the collection of Dr STROYAN, Dr REMAUDIÈRE and Dr SWIRSKI.

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