

It is claimed that in the swimming of the monoflagellates in general the function of the flagellum is primarily to cause the organism to rotate and gyrate, and it is this gyration and rotation which produces the forward component in the swimming of the organism.

The matter is of considerable importance from the point of view of organic evolution, for it indicates that the first type of swimming movement evolved was that of the inclined plane or the propeller, which is the simplest and most efficient of all mechanical devices used in a fluid medium.

It is still stated in the majority of text-books that in an organism such as *Euglena* the waves or impulses start at the tip of the flagellum and draw the organism through the water. This concept is incorrect, and it is founded on no sort of scientific observation.

Paper read in title :—

'Materials for a revised Flora of Palestine.—I.' by Dr. NAOMI FEINBRUN. [Printed in full below.]

### MATERIALS FOR A REVISED FLORA OF PALESTINE.—I.

By NAOMI FEINBRUN, Hebrew University, Jerusalem.

Through the kindness of Mr. J. E. Dinsmore (American Colony, Jerusalem) it has become possible for the writer to use the Herbarium of Post (American College of Beirut), as well as Mr. Dinsmore's own herbarium, for the past few years. Thus she was able to verify various older records of the Palestinian Flora, which had remained dubious after the publication of the revised edition of Post's Flora (G. E. Post, 'Flora of Syria, Palestine and Sinai', revised by J. E. Dinsmore, 1931-33), and of the catalogue of Palestinian plants by Eig (A. Eig, 'Les éléments et les groupes phytogéographiques auxiliaires dans la flore palestinienne'. Tableaux analytiques. Fedde, Repert. Beihf. Bd. 63, 2). Some of the results of the revision are given here. Several plants new for Palestine, found during the last few years by various collectors, are also recorded here.

#### *Abbreviations used in this paper.*

DISTRICTS.—A : Amman ; AP : Acre Plain ; C : Carmel ; E : EDOM ; EP : Esdraelon Plain ; FN : Far Negeb ; HP : Huleh Plain ; J : Judean Mountains ; LG : Lower Galilee ; S : Sharon ; SA : Samaria ; SH : Shephela ; UG : Upper Galilee ; UJ : Upper Jordan Valley.

COLLECTORS : E. A. Eig ; F. N. Feinbrun ; Z. M. Zohary.

HERBARIA : DiH : Dinsmore Herbarium ; PH : Post Herbarium. When not otherwise mentioned, the plants are preserved in the Herbarium of the Botanical Department of the Hebrew University.

#### VIOLACEAE.

*Viola pentadactyla* Fenzl var. *parviflora* Feinbr., var. nov.

Flores minores, petala calyci aequantia, calcar appendice calycino paulo longius vel subsequilongum.

Jerusalem, fields (1941 D. Zohary, 1942 Kushnier).

The type variety has not been found in Palestine.

## PRIMULACEAE.

*Cyclamen coum* Mill.

UG2 : Top of Jebel Jermak, maquis in humus (1942 P. H. Davis).

This species is apparently restricted to Asia Minor, Syria, and Northern Palestine. The species has been previously recorded from the Caucasus and Bulgaria. But in the Caucasus *C. coum* is replaced by *C. ibericum* (according to Grossheim), and in Bulgaria and Southern Roumania (Dobrogea) by *C. durostoricorum* Pantu & Solacolu. We could not find out from which locality the type specimen *C. coum* originated. The species was probably described by Miller from a cultivated plant. Bornmueller ('*Florula Lydiae*', 1908) supposes that *C. coum* occurs on Takhali-dagh; a farmer from Bunerbaschi told him about a small-corned *Cyclamen* which he used to supply to Withall Co., in Smvrna.

## SCROPHULARIACEAE.

*Linaria Cymbalaria* Linn.

Jerusalem, waste places (1917 Meyers and Dinsmore DiH); Jerusalem, shady wall (1940 D. Zohary).

Not recorded at all in Boissier's '*Flora Orientalis*'. Chiefly a west Mediterranean species.

*Herpestis Monnieria* (Linn.) HBK.

Near the Genezareth Lake (1941 Palmoni).

Known till now in Palestine from the Palestino-Egyptian boundary (Coastal Negeb) only.

*Veronica stenobotrys* Boiss.

UG : Jebel Jermak, in *Quercus calliprinos*—*Quercus infectoria* maquis (1942 F).

var. *leiocarpa* Boiss.

Together with the type.

This species varies in hairiness of the fruit and calyx lobes. Eig (1932) admitted that only var. *leiocarpa* occurred in Palestine, and he recorded it as a separate species (*V. leiocarpa* Boiss.). However, on new and abundant material from Palestine and Syria, we could ascertain that both, the type and the variety, occurred generally together. The glabrous form is thus a mere variety of *V. stenobotrys* Boiss.

*Veronica Tournefortii* Gmel.

UJ : Tiberias, vegetable garden (1923 E); EG : Rosh-Pinah (1926 Z 1937 Rayss).

## LABIATAE.

*Lamium striatum* Sibth. et Sm. var. *minus* Boiss.

UG : Jebel Jermak, in *Quercus calliprinos*—*Quercus infectoria* maquis (1942 F).

This plant has been recorded by Post from Gilead without exact locality.

*Ballota foetida* Lam.

SA : Nablus (1908 No. 142 Dinsmore DiH).

This specimen is recorded in Post's Flora (1933) under *B. nigra* Linn. The latter is an Eurosiberian-Boreoamerican species, whereas *B. foetida* is a Mediterranean one.

*Teucrium Montbretti* Benth.

SA : Wadi Suwenit, below Mihmas, shade of overhanging cliffs (1942 P. H. Davis).

This East-Mediterranean species has been known till now as far south as Northern Syria. Our record widens the range of the species much to the south. We also possess a specimen from the cliffs between Batroun and Tripoli (1931 E Z) ; this specimen constitutes thus a connecting link with our new and rather remote station in Palestine.

*Teucrium leucocladum* Boiss.

FN : North-west of 'Aqaba, Wadi el Masri, 5 km. off the mouth of the Wadi, in furrow of granite rocks, 225 m. ; ca. 8 km. North of Ras el Naqb, valley between granite hills, gravel and sand, 780 m. (1936 E F Z).

Reported from Wadi Hebran of Sinai.

## ALISMATACEAE.

*Alisma Plantago-aquatica* Linn.

HP : Lake Huleh, in water (1941 Mendelson).

The species usually recorded under this name from Palestine is *A. lanceolatum* (Eig et Feinbrun, 'New Plants of Palestine', Palest. Journ. of Bot., J. Ser. 1939). This is the first specimen of the true *A. Plantago-aquatica* found in Palestine. The nearest station in Syria given by Samuelsson (1932) is between Zahle and Baalbeck, in the valley of Caelesyria forming the northern continuation of the Jordan Valley.

## SPARGANIACEAE.

*Sparganium neglectum* Beeby.

S : Wadi Musrara, near Tel-Aviv (1925 E), Petach-Tiqwa (1921 E) ; EP : Rub'a el Nasra marsh (1923 Z) ; UG : Dan (1923 Naftolsky) ; HP : Huleh, near Wasieh (1924 E).

var. *oocarpum* (Ostenf.) Čelak.

HP : Marshes of Huleh (1924 E).

This species has been recorded from Palestine under *S. ramosum* Huds.

## ORCHIDACEAE.

The difficulty in the identification of dried Orchids caused many inaccurate data to be entered into the list of Palestinian Orchids by botanists who were unable to study them in a living state. Closer examination of living material from different parts of the country as well as access to older herbaria enabled the writer to revise and correct the list of Palestine species of this fascinating family.

The literature used for this revision is: (1) Schlechter, R. (1928), 'Monographie der Gattungen und Arten', vol. 1 of 'Monographie und Iconographie der Orchideen Europas und des Mittelmeergebietes', by G. Keller und R. Schlechter. (2) Keller, G., and Soó, R. (1930-33), 'Kritische Monographie', etc., vol. ii of 'Monographie und Iconographie', etc. (3) Renz, J., various papers in Fedde's Repertorium.

*Ophrys Speculum* Link (Sect. *Myodes*).

I have not seen this Western Mediterranean species from Palestine. The record from Palestine by Schlechter (1928) and Soó (1930) is based on data of Tristram, most of which have to be verified.

*Ophrys lutea* Cav. ssp. *galilaea* (F. et Bornm.) Soó (v.v.s.) (Sect. *Myodes*).

This is the only form of the cyclus of *O. lutea* found in Palestine. All records of *O. lutea* in Post's Flora (1933) are to be referred to ssp. *galilaea*.

Soó (1930) mentions this form as 'die zweifelhafte, nach einem einzigen Exemplar beschriebene, vielleicht monstroese ssp. *galilaea* aus Syrien'. We possess specimens of this plant from all mountainous parts of Mediterranean Palestine (Judea, Samaria, Carmel, Upper Galilee). It is one of the first *Ophrys* species of the rainy season.

*Ophrys fusca* Link (v.v.s.) (Sect. *Myodes*).

It is the commonest *Ophrys* species of Palestine at the beginning of the rainy season (January-February). Occurs in all Mediterranean parts of Palestine.

*Ophrys iricolor* Desf. (v.v.s.) (Sect. *Myodes*).

This showy *Ophrys* is rare in Palestine. It is recorded by Post (1933) only from the Jerusalem district, but has been recently found also on Mount Carmel (1941, Kushnier).

*Ophrys fuciflora* Hal. (v.v.s.) (Sect. *Arachnites*).

UG: Jebel Jermak (1942 Zaitchek); Alonim (between Haifa and Nazareth) in the *Quercetum ithaburensis* (1941 Kreize, 1942 Feinbrun); C: Mount Carmel, Esfiah to Yagur (1942 Kushnier) and Dalia (1941 Weissman); J: Ain Tulma (1915 Dinsmore 4602 sub. *O. oestriifera*); Artuf to Deir esh-Sheikh (1926 Zohary).

Schlechter (1928) and Soó (1930) doubt the occurrence of this species in Palestine. In fact it is rather rare and occurs only in the maquis.

*Ophrys tenthredinifera* Willd. (Sect. *Arachnites*).

This West-Mediterranean species does not occur in Palestine. The record in Post's Flora (1933) from Judea is based on a wrongly determined specimen of *O. Dinsmorei* Schltr.

*Ophrys Bornmuelleri* M. Schulze (v.v.s.) (Sect. *Arachnites*).

This East-Mediterranean plant is one of the showy *Ophrys* species of Palestine. The sepals are white or pinkish. It is found in the maquis or batha of the Mediterranean territories of Palestine, and is flowering chiefly in April. We doubt that *O. grandiflora* Fleishm. et Soó is a constant form.

*Ophrys mammosa* Def. (Sect. *Arachnites*) and *O. ferrum-equinum* (Sect. *Arachnites*).

These species do not occur in Palestine. Both were recorded by Eristram only.

*Ophrys Spruneri* Nym. (Sect. *Arachnites*).

The data on this species in Post's Flora (1933) have to be referred to *O. Sintensisii*.

*Ophrys Sintensisii* Fl. & Bornm. (v.v.s.).

This species is one of the commonest *Ophrys* species of Palestine and is known to us from all Mediterranean districts of Palestine. It has green sepals, brownish-green petals, and a dark purple labellum. The labellum varies slightly from lobed to entire.

*Ophrys oestifera* MB. (Sect. *Poecilophrys*).

This species does not occur in Palestine. The writer identified three specimens under this name mentioned in Post's Flora: the specimen from Mount Carmel (Post Herbarium) proved to be *O. Bornmuelleri* M. Schultze, those from Galilee (Post Herbarium) and from Ain Tulma, Judea (Dinsmore Herbarium) were *O. fuciflora* Hall

*Ophrys cornuta* Stev. (Sect. *Poecilophrys*).

This species does not occur in Palestine. The records of Barbey ('forma non cornigera') and of Killermann are dubious.

*Ophrys Dinsmorei* Schltr. (v.v.s.) (Sect. *Poecilophrys*).

UG : Kefar Gileadi (1925 Smoly, 1941 F Z) ; Hurfesh (1927 Smoly) ; LG : Nazareth (1927 Meyers et Dinsmore DiH). C : Carmel (1922 E). SA : Wadi Siquiya to Wadi Rijan (1930 F Z). J : Jerusalem, Mount Scopus (1931 Amdursky) ; Artuf (1924 E). S : Hedera (1927 E). SH : Rishon le Zion (1925 E).

Soó (1931) regards *O. Dinsmorei* as synonymous with *O. carmeli* Fl. et Bornm., and prefers the last name, although both were given in the same year. The writer prefers to retain the name *O. Dinsmorei*, because almost all the specimens seen correspond better with the description of Schlechter, which differs from that of *O. carmeli* in several points. The petals of *O. Dinsmorei* are described as 4 mm. long and 2 mm. broad, those of *O. carmeli* as 3 mm. x 3 mm. ; the length of labellum in *O. Dinsmorei* 7 mm., in *O. carmeli* 10 mm. These characteristics do indeed somewhat fluctuate ; several sheets from Hedera in our Herbarium show transitions from larger flowers to the smaller typical ones. The majority of our specimens are rather typical *O. Dinsmorei*. Thus *O. carmeli* is regarded by the writer as an untypical *O. Dinsmorei*.

The colour of the flower was not known to Schlechter. The colour of the sepals and petals is green or white, that of the labellum is dark brown getting paler during anthesis ; the recurved margins of the labellum and the appendix are green.

*Ophrys apifera* Huds. (v.v.s.) (Sect. *Poicilophrys*).

This showy species is rare in Palestine. It has been found on Mount Gilboa among rocks (1942 Kushnier); near Ramallah (1942 Girls School) and on Mount Carmel (1945 Weiss).

The number of *Ophrys* species of Palestine is thus eight.

*Serapias vomeracea* (Burm.) Briq. (v.v.s.) (Sect. *Bilamellaria*).

Found in almost all Mediterranean districts of Palestine.

*Anacamptis pyramidalis* (Linn.) Rich. (v.v.s.).

Rather common in the mountainous parts of Mediterranean Palestine. One of the latest orchids of the season (flowering in May). Has a pleasant smell.

*Himantoglossum Bolleanum* (Siehe) Schltr.

UG: Top of Jebel Jermak, 1200 m. (1943 A. Israëolith).

This East-Mediterranean species is new for Palestine. Schlechter (1928) records its distribution: 'In Juniperus Waeldern, bisher nur aus Cilicien; wahrscheinlich auch in Nord-Syrien'. Post's second edition does not record it from Syria.

Upon comparison of the above specimen with *H. affine* (Boiss.) Schltr. from Duluk Baba near Aintab (1889 Shepard PH) the writer concludes that the maintaining of *H. Bolleanum* as a separate species is justified.

A specimen of *H. affine* from Olympus, Bithynia (PH) has also been examined. This species has not been mentioned by Schlechter from that part of Asia Minor.

*Neotinea intacta* (Link) Rehb. f.

The plant is very rare in Palestine. It has been found till now only in the Judean Mountains (the specimen recorded in Post's Flora has been verified by the writer).

*Orchis papilionaceus* Linn. var. *minimum* Camus (v.v.s.) (Sect. *Phalaenanthus*).

The typical *O. papilionaceus* does not occur in Palestine. The writer determines the Palestinian form as var. *minus* Camus recorded from Cilicia and Syria. Although the Palestinian specimens have a larger labellum, reaching 8 mm. in width (and not only 5 mm.), they seem to correspond better to this than to any other described variety which all possess much larger flowers. *O. papilionaceus* var. *minimum* is one of the commonest Orchids of Palestine.

*Orchis morio* L. (Sect. *Morianthus*).

The specimens recorded in Post (1933) under this name from Palestine were examined. They belong to *O. succata*.

*Orchis pictus* Lois.

UG: near Peki'in (1927 E).

The specimens are not entirely white (spurs pink, labellum purplish with purple dots) and differ in this respect from *O. pictus* var. *albiflorus* (Boiss.) Renz. recorded from Syria.

*Orchis coriophorus* Linn. (Sect. *Coriophoranthus*).

The Palestinian specimens probably belong to var. *pseudofragrans* Nevski which is reported (Flora of U.S.S.R. 1935, iv, 682) from Transcaucasia, Talysh, Persia, and Syria. The flowers have a pleasant smell. The leaves are 1-2.5 cm. wide. Our specimens are from marshy places in the Esdraelon Plain (Tel Yoseph 1924 Eig), the Coastal Plain (Petach Tiqwa, 1922 Eig; Hedera 1926 Eig) and the Upper Galilee (Peqi'in 1942 Kushnier).

*Orchis sanctus* Linn. (v.v.s.) (Sect. *Coriophoranthus*).

This species occurs in the batha and garigue of Upper Galilee, Mount Carmel, Sharon, Shefela and Gilead.

*Orchis tridentatus* Scop. (Sect. *Heranthus*) var. *commutatus* (Tod.) Rehb. f. (v.v.s.).

Rather common in the batha and maquis of the mountainous parts of Palestine (Upper Galilee and Lower Galilee, Carmel, Sharon, Samaria, Judea).

According to Soó var. *commutatus* has an East-Mediterranean distribution; it differs from the type by the marginate middle lobe of the labellum bearing a short interjected point.

*Orchis lacteus* Poir. (Sect. *Heranthus*).

The writer did not see this species from Palestine. The specimens recorded in Post's Flora are: *O. tridentatus* var. *commutatus* (Hebron to Jerusalem PH) and *O. sanctus* (Artas D).

*Orchis militaris* Linn. (Sect. *Heranthus*).

This species, reported from Gilead by Tristram and Paine, does not occur in Palestine. The specimens in question were probably wrongly determined *O. punctulatus*, which occurs in Gilead.

*Orchis Simia* Lam. (Sect. *Heranthus*).

This species does not occur in Palestine. All specimens from Palestine referred to it belong to *O. galilaeus* Schltr.

*Orchis italicus* Poir. (Sect. *Heranthus*).

This species occurs in the Lebanon and is found on the northern boundary of Palestine (north of Metula).

*Orchis punctulatus* Stev. (Sect. *Heranthus*).

The species has been found in Palestine in Gilead (Env. of es-Sueli, 1929 E Z); three hours south-east of es-Salt (1911 Meyers and Dinsmore DiH).

The occurrence of this East-Mediterranean-Irano-Turanian species in Palestine was questioned by Schlechter (1928). Soó (1932) records for Palestine only *O. punctulatus* ssp. *galilaeus* which is synonymous with *O. galilaeus*.

*Orchis galilaeus* Schlt. (v.v.s.) (Sect. *Heranthus*).

Rather common in the batha and maquis of Palestine (Upper Galilee, Carmel, Samaria, Judea). Recorded by most Palestinian botanists under *O. Simia* Lam.

*Orchis saccatus* Ten. (v.v.s.) (Sect. *Andranthus*).

This species is not recorded from Palestine either by Schlechter (1928) or by Soó (1932). It is rather common in the following districts: Shefela, Sharon, Carmel, Esdraelon Plain, Tabor.

*Orchis anatolicus* Boiss. (v.v.s.) (Sect. *Andranthus*).

This species is rather common in the Mediterranean territories of Palestine in the batha.

*Orchis laxiflorus* Lam. ssp. *Dielsianus* Soó (v.v.s.) (Sect. *Andranthus*).

This is the common orchis of the marshy places of both Cis- and Transjordan. From Transjordan only one record by Tristram from Gilead has been available till now. A specimen from el-Azraq (1937 Dinsmore DiH) has been examined by the writer.

*Orchis paluster* Jacq. (Sect. *Andranthus*).

This species does not occur in Palestine.

*Orchis ibericus* MB (Sect. *Iberanthus*).

The only specimen recorded in Post's Flora from Palestine (Samaria) was collected and labelled by Fox, whose geographical data are unreliable. The occurrence of this species in Palestine is thus dubious.

*Orchis incarnatus* Linn. var. *olocheilos* Boiss. (Sect. *Klingeanthus*).

The specimen from Samaria (by Fox in Post's Herbarium), as well as several specimens from Syria, all recorded in Post's Flora (1933), have been identified as *O. laxiflorus* ssp. *Dielsianus*.

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No species of subgenus *Dactylorchis* has been found till now in Palestine. The number of species belonging to the genus *Orchis* in Palestine is ten.

*Epipactis latifolia* All.

This species is mentioned from Palestine only by Eig (1932). Neither Post (1933) nor Schlechter (1928) record it from this country. We possess specimens from the maquis of Upper Galilee (1926 E Z, 1942 F).

*Epipactis veratrifolia* Boiss.

This species, endemic in the East-Mediterranean (Asia Minor and Syria) has been recorded from Palestine only by Tristram from Galilee. It is probable that it has not been found again till now, because of its flowering as late as August.

*Cephalanthera longifolia* (Huds.) Fritsch.

Found in Upper Galilee, on Mount Carmel and in Gilead in the shade of maquis and of *Pinus halepensis* forest.

*Limodorum abortivum* (Linn.) Sw.

This parasitic orchid occurs in Palestine in the region of the *Quercus calliprinos*-maquis and *Pinus halepensis* forest.



## LILIACEAE.

*Scilla Hohenackeri* Fisch. et Meyer.

C : Mount Carmel near Yagur (1942 Kushnier). UG : Ailon (1940 F Z).

The plant reported by Tristram and then by Post from Mount Carmel and Tabor under *S. cernua* Red. is probably identical with *S. Hohenackeri*. *S. cernua*, synonymous with *S. siberica* Andr., does not occur either in Palestine or Lebanon.

*Eremurus libanoticus* Boiss. et Bl.

M : Amman to Ziza (1929 E Z). E : 23 km. south-west of Ma'an (1936 E F Z).

This plant deserves, in the opinion of the writer, a specific rank. The true *E. spectabilis* does not occur in Palestine.

## GRAMINEAE.

*Anthistiria ciliata* Linn. fil.

UJ : Kinnereth (1941 R. Shafrurith).

This is the southernmost station of this species.

*Poa persica* Trin.

The writer has not found this species in Palestine, and doubts whether it occurs here at all. The specimen from Ajlun recorded in Post's Flora (1933) and examined by the writer is *P. trivialis*. This last has not yet been recorded from Transjordan.

*Glyceria plicata* Fries.

This species does not occur in Palestine. The specimen from Ras ul Ayn recorded in the revised edition of Post's Flora is *Catabrosa aquatica*.

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**PROCEEDINGS OF THE GENERAL MEETING**

**22 February 1945**

held jointly with the Zoological Society of London

Mr. A. D. COTTON, O.B.E., President,  
in the Chair.

The Proceedings of the General Meeting held on Thursday, 8 February 1945, having been circulated, were taken as read and confirmed.

The following were thanked for gifts made to the Library since the last meeting :—Dr. Annie Porter, Mr. I. H. Burkill, Dr. V. J. Chapman and Professor F. E. Fritsch.

The President reported the death of Mr. William Edward Nicholson, Fellow of the Society.