Irrespective of the size of the parasites, the host cells are slightly hypertrophied and their outline is invariably distorted. The mature elongated forms produce a marked displacement of the host cell's nuclei but the young forms generally do not produce any change in the position of these nuclei.

It is evident that the parasites described above are undoubtedly hæmogregarines. The mature elongated forms are most probably gametocytes, whereas the young forms would represent early stages in the formation of two distinct types of development, thus the oval young forms may develop into an early erythrocytic schizonts whereas the thin forms are probably merozoites which will develop to form the elongated mature forms. These assumptions about the pathways of the various forms of the parasite in the blood of the final host can be arrived at if we take into consideration comparable forms of other well-studied related hæmogregarines of poikilothermic vertebrates.[6,7]

The problem of identifying the present parasites to the generic level is a fairly difficult one. It is believed that the generic identification of hæmogregarines depends mostly on the biological features of these parasites in their invertebrate hosts.[8] With very few exceptions, the hæmogregarines of land reptiles were assigned to the genera *Schillakia* Reichnow, *Karyolusus* Labbe or *Hæmogregarina* Laveran and Negre on very arbitrary basis.[1]

To the best of our knowledge, the only record of hæmogregarines in the geckos of the Sudan is that of Riding.[9] There is little doubt that a further study on the other stages of the present parasites in the organs of the vertebrate host together with a thorough search for its invertebrate phase once its vector is known, will throw light on its proper identification.

Department of Zoology, M. F. A. Saoud.
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VARIETAL RESISTANCE TO *BRUCHUS* SP. IN COWPEA (*VIGNA SINENSIS*) UNDER STORAGE CONDITIONS

Bruchus sp., locally known as Dhora, is an important stored grain pest of cowpea. The average annual loss caused by this insect in the storage in the country is estimated at 16–20%. In the present investigation an attempt has been made to find out the degree of resistance in some cowpea varieties for possible selection of resistant strain for large-scale cultivation.

During the year 1967, forty varieties of cowpea of exotic and indigenous origin were put for varietal testing in four replications in petri dishes. In each replication 100 seeds of each variety were used. Petri dishes containing the seeds were put in fine sieved cage and an insect population at the rate of 10,000 weevils per replication was introduced in the cage. As moisture content of the seed plays an important role in the storage of seed, samples were drawn from the varietal bulk having 8–10% moisture content for this purpose. The observations regarding the damage were recorded after 65 days of starting the trial. All the observations were recorded under normal room temperatures of 22° C.

These observations indicated that the damage caused by these pests ranged from 1 to 100%. This also helped the authors to grade the varieties into five different groups, namely, resistant, tolerant, low susceptible, medium susceptible and highly susceptible. The results are shown in Table I.

TABLE I

Varietal resistance to Bruchus *in cowpea* (Vigna sinensis)

Sl. No.	Group	Damage Range %	No. of varieties with examples
1	Resistant	.. 1-2	1.(T_2)
2	Tolerant	.. 14-25	9.EC 598A, EC, 1959
3	Low susceptible	.. 27-53	11 EC 2543 and EC 598
4	Medium susceptible	.. 63–80	4 EC 4216, Suttons white-seeded
5	Highly susceptible	.. 81–100	15 RS 9, Pusa Barsati

From the above results it can be concluded that variety T2 of cowpea (*Vigna sinensis*) which has shown a high degree of resistance towards the storage pest *Bruchus* sp. can be

used as a donor parent for breeding against susceptibility to this insect.

Government Agriculture Research Station, Durgapura, Jaipur (Rajathan), *March* 15, 1969.

R. P. CHANDOLA.
K. B. TREHAN.
L. R. BAGRECHA.

EVIDENCE FOR POPULATION DIFFERENTIATION IN *MARSILEA MINUTA* L.

As early as 1922 Turesson[1] had shown that species are composed of a mosaic of populations, which he termed as ecotypes, each being adapted to a particular habitat. This adaptation may be 'any feature of an organism or its parts which is of definitive value in allowing that organism to exist under the conditions of its habitat'.[2]

While studying the responses of *Marsilea* species obtained from different parts of the country, to various edaphic and climatic factors,[3] it was noticed that the plants of *M. minuta* collected from roadside ditches at Chandauli (Varanasi, India) did not produce sporocarps even after prolonged cultivation for two years. Field observations also did not bring to record the production of the sporocarps by plants in nature. Accidentally, it was observed that the plants of the same collection had produced sporocarps in the garden while growing on a heap of farm-yard manure. An analysis of the soil from the roadsides at Chandauli revealed a very low organic matter content (1·1%), low nitrogen content (1·2 mg./100 g.) and high exchangeable calcium content (12·8 m.e.%). The soil analysis from other places where *M. minuta* grew, gave 2·2 to 4·7% organic matter, 2·7 to 4·6 mg./100 g. nitrogen and 3·6 to 11·8 m.e.% exchangeable calcium.

An experiment was designed to study the responses of the different *Marsilea* collections to the soil organic matter content. Five-internode pieces of rhizomes taken from clonal cultures of various *Marsilea* collections were planted in pots filled with garden soil and farmyard manure mixed in different proportions. All the pots were uniformly watered daily. The analysis of soil showed the organic matter content of the pots to vary between 0·4% and 13·2%. It was noted that the plants from roadsides at Chandauli produced sporocarps at a very high organic matter content of the soil (13·2% only) while the plants of the same species collected from other places at Varanasi, Alwar, Ahmedabad, Kanpur, Gorakhpur, Meerut, Patna and Ajmer, etc., produced the sporocarps in a very wide range of the same (0·4 to 13·2%). It was also noted that when pieces of the Chandauli roadside clone producing sporocarps, under the influence of high organic matter content, were transplanted back on the soil with less organic matter content, the plants stopped producing sporocarps further. These observations thus reveal that the plants from Chandauli roadsides represent an ecologically and physiologically different population.

Mehra and Loyal,[4] working on the cytology of different *Marsilea* species, recorded three different biotypes in *M. minuta* based on morphological differences in the sporangial contents and the chromosome behaviour at meiosis. These authors also visualised the presence of 'ecotypes' in *M. minuta* as their three biotypes came from three different parts in India. An examination of the sporangial contents from the sporocarps of plants under study further revealed that in Chandauli roadside population the sporangia contained only 16 'monads' while in other cases the number of aberrant spores and pseudospores varied widely. This adds to the fact that genetically also the Chanduali roadside population is different from those examined in this study. Undoubtedly it is the genetic set-up of an organism that regulates its physiological responses so specifically and also within a decided range.

Thus, sufficient evidence exists to say that Chandauli roadside population represents an ecotype in the *M. minuta* species complex while the other populations have yet to be established for their habitat preferences.

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Department of Botany, Banaras Hindu University, Varanasi-5, India, *March* 18, 1969.

BRIJ GOPAL.

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