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**RECORD OF ANKYLOPTERYX
 OCTOPUNCTATA CANDIDA (FABRICIUS)
 (NEUROPTERA: CHRYSOPIDAE), AS EGG
 AND LARVAL PREDATOR ON OPISINA
 ARENOSELLA WLK., THE LEAF EATING
 CATERPILLAR OF THE COCONUT PALM**

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THE chrysopid *Ankylopteryx octopunctata candida* (Fabricius) was newly recorded in association with the larval galleries of *Opisina arenosella* on coconut palms. They were first collected during 1982 from an experimental field at Kannelty, Quilon Dt., Kerala. Further observations revealed that they consumed the eggs and early instar larvae of *Opisina arenosella*. As early as 1934, Takano had reported this insect as a predator of the sugarcane aphid *Oregma lanigera* in Formosa. The present record is an addition to the check list of predators of *O. arenosella* on the coconut palm. Adults of *A. octopunctata candida* are green in colour, females measuring 8 mm long and 22–23 mm wide (wing expanded) and males 7.0–7.5 mm long and 20–21 mm wide; with soft body and elongated filiform antennae.

Adults are nocturnal and during day time they rest on the leaflets of the palm. The larvae are predacious and possess long hairs on the body and carry exuviae of prey on their back. They feed on the eggs and early instar caterpillars of *O. arenosella*.

Feeding trials have revealed that each first instar larva consumed 2 to 3, second instar 60 to 100 and third instar 100 to 130 eggs of *O. arenosella* per day under laboratory conditions. It was also observed that the third instar predator larva consumed as many as 11 to 19 first instar caterpillars of *Opisina* per day.

The adult of the predator lays pedunculate eggs in batches on the infested coconut leaflets, which hatch in two days. The larval period ranges from 9 to 11 days and larva has 3 instars. Pupation takes place in or near the leaf axils and the pupal period ranges from 10–12 days. The average longevity of the females was 66.4

days (range 50–72 days) while it was 23 days (range 17–35 days) in males, when fed with honey under laboratory conditions.

The chrysopid predator appeared in the field during April and continued to be present till October and absent from November to March. Maximum predator population was noticed during June and July months.

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**GENETIC VARIATION FOR SEED
 PROTEIN OF VICIA FABA L.**

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FABABEAN (*Vicia faba* L.), locally known as *bakla*, is one of the under-utilized food legumes in India. This legume seems to be exceptionally productive, and is a valuable source of novel protein. Rain-fed fababean yields 20 g of seed per ha¹. However, seed yield as high as 30 q per ha may be obtained with irrigation. Fababean is used more and more exclusively for its seeds, whose lysine and protein make a good complement to cereals². With sufficient breeding and agronomic research support, it could become a top ranking pulse crop of India. The present investigation was conducted to critically examine genetic variation for protein content of seeds in exotic and local fababean collection and determine the scope for improvement of protein along with seed yield.

Eighty four exotic cultivars from West Germany and nine indigenous cultivars from the main centres of All-India Co-ordinated Pulse Improvement Project were evaluated in the field at Hissar during the winter season of 1983 following a randomized complete block design. Each entry was accommodated in 3 m long single row plots spaced 50 cm apart. The spacing between plants within a row was 20 cm. The seed protein was estimated using micro-kjeldahl method and expressed in percentage. The statistical para-

meters, simple correlations, partial correlations and regressions between protein content, yield and seed weight were computed.

Significant differences existed between exotic and indigenous cultivars for protein content (table 1). A comparison of the overall mean seed protein of the two groups of cultivars indicated that the exotic types had significantly less protein in seeds than the indigenous cultivars. As shown by the range and the genotypic and phenotypic coefficient of variation, there was substantial amount of genetic variation for improving protein content by selection.

Table 1 Analysis of variance and variability parameters for seed protein in fababeen.

A. Analysis of variance			
Item	DF	Mean squares	
Cultivars	92	15.3*	
Exotic	83	12.6*	
Indigenous	8	41.3*	
Exotic vs. Indigenous	1	30.5*	
Error	184	1.2	

B. Variability parameters			
Parameter	Exotic cultivars	Indigenous cultivars	All cultivars
Mean (\pm S.E.)	18.1 \pm 0.61	19.5 \pm 0.61	18.3 \pm 0.61
Range	12.3 - 25.6	12.5 - 25.9	12.3 - 25.9
Phenotypic coefficient of variation (%)	11.3	19.50	12.5
Genotypic coefficient of variation (%)	10.8	18.75	11.8

* Significant at $P < 0.01$

The first task of legume breeders must be to increase yield and then to improve protein content. In practice, legume breeders have generally reported negative correlations between yield and seed protein³ and positive correlations between yield and seed weight⁴. In the present investigation, however, the simple and partial correlations, and partial regression coefficients between seed protein, yield and seed weight were insignificant. The results thus suggested that seed yield and seed weight had no role in influencing the protein content of seeds and these traits were independently heritable. Hence, selection for increasing protein content in seeds may not cause any undesirable effect upon seed yield and seed weight. Clearly, in fababeen there is considerable scope for improvement of both

protein and yield by selection because these two characters showed no negative relationship.

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RESISTANCE OF RICE CALLUS TISSUES TO SODIUM CHLORIDE AND POLYETHYLENE GLYCOL

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CALLUS tissues of higher plants have been used to select numerous variant cell lines¹⁻². The variant cells are usually selected from a population of cells by imposing a particular stress or selection pressure on the population. It may be possible to select mutations for increased salt tolerance and drought resistance at the cellular level using tissue culture. Resistance to certain types of stresses like drought and salt has potentially large agricultural value. Nabors *et al*³ reported the selection of a sodium chloride tolerant line of tobacco cells. Cells of tomato capable of an enhanced ability to grow in the presence of water stress were obtained by exposure of cultured cells to a medium containing polyethylene glycol (PEG) by Bressan *et al*⁴. The addition of polyethylene glycol to the nutrient medium of cultured plant cells stimulates water stress by acting as a non-penetrating osmotic agent which lowers the water potential of the medium in which the cells are growing. Thus, cells resistant to water stress might be selected from populations by using PEG as the stress agent. We report here the isolation of plant cells resistant to PEG and sodium chloride and the subsequent regeneration of whole plants from such cells.

Callus cultures of rice varieties Jaya and Tellahansa were initiated from the mature embryos on Linsmaier and Skoog's⁵ (LS) medium containing 2 mg l of 2,4-