utrine rotundata, 0–1 septata, 12–15 × 3–4 μm. *Chlamydosporae* globosae levia et tenuitunicata, album vel brunneum, 5–15 μm diametero.

Habitat: Ex *Mangifera indica* Linn, 12 September 1985, Pantnagar, Anupam Varma (HCIO 38231 Holotypus, ITCC 3549 Isotypus).

The above description of *C. mangiferum* clearly places this species in group 4 of the genus[4]. This group has 13 species. Of these *C. mangiferum* resembles *C. tenue, C. gracile, C. indicum* and *C. reteaudii* more closely than other species. A close examination, however, differentiates *C. mangiferum* from these species as they differ in the size and shape of conidia, and cultural characters. For example, *C. mangiferum* has faster growth rate, absence of reddish brown pigment in aerial mycelium and also agar medium, smaller and less septate conidia, longer phialides as well as smaller chlamydospores and rough walled submerged hyphae. On the basis of various distinguishing features of the new fungus the following key has been developed for help in identification.

Microconidia absent but chlamydospore present

Macroconidia straight and cylindrical:

a. Conidia 0–1 Septate	(i)	12–15 × 3–4 μm size – *C. mangiferum* sp nov
	(ii)	16–20 × 2–3 μm size – *C. tenue* Bugn[4]
b. Conidia 1–Septate	(i)	26–44 × 3–4 μm size – *C. gracile* Bugn[4]
c. Conidia 4–Septate	(i)	15–26 × μm size × *C. indicum* Chowdhry[5]
	(i)	80–110 × 6–7 μm size – *C. reteaudii* Bugn[4]

The type materials of *C. mangiferum* have been deposited in *Herbarium Cryptogamiae Indiae Orientalis* and Indian Type Culture Collection, IARI, New Delhi.

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SPEED OF GERMINATION AND ITS GENETICS IN CHICKPEA (*CICER ARIETINUM* L)

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SPEED of seed germination (germination rate) has been recognized in certain cases as a useful parameter of seed quality[1] and has been used as a criterion in field crops for evaluation of seedling vigour. Among food legumes the effect of speed of germination on the development and seed yield has been investigated employing soyabean[2]. In chickpea, an important food legume, there are no reports on differences in speed of germination and its genetics.

A spontaneous mutant E100y(m) reported[3] earlier is a late germinator and takes 15–16 days for emergence as compared to 7–8 days by the parent E100y and other lines. The present study included E100y and H81-73, normal germinators; and [E100y(m)], slow germinating mutant line; the F_1 and F_2 generations of the two crosses between the normal and slow germinating lines. The seeds were

planted in a well-prepared field having sandy loam soil with ideal conditions for chickpea germination. The seeds were placed at a depth of 8 cm in rows, 4 m long, spaced 40 cm and the seeds in a row were planted 10 cm apart. There were 100 seeds of each of the parental lines and F_1's and 1000 seeds of each of the two F_2's. The days to emergence were counted as days for germination and the speed of germination was calculated by dividing the number of seedlings obtained at each counting by the number of days the seeds have been in the soil. The days for emergence and per cent germination for different parents and generations are given in table 1.

The data (table 1) showed that there were no differences for per cent germination between E100y and E100y(m); however, large differences were observed for rate of germination. E100y and H81-73 germinated and emerged faster as indicated by higher germination rate. In the field, the rapidly germinating plants matured earlier and were taller than the slow germinating plants. There were apparent differences in germination speed and χ^2 values showed a good fit for 3:1 ratio. It was, therefore, inferred that the differences between the normal and the slow germinating lines were heritable. The differences are controlled by single gene with normal germination being dominant over slow germination.

To confirm the monogenic F_2 ratio, the F_3 segregation was studied in both the crosses. In the cross E100y(m) × E100y, all the 15 F_3 families from slow germinating F_2 plants bred true. Similarly in the cross H81-73 × E100y(m), the 10 slow germinating F_2 plants bred true for the character. The F_3 families from normal germinating F_2 plants of both the crosses segregated in a ratio of 1 normal : 2 segregating : 1 slow germinating (table 2). This

Table 1 *Germination percentage, rate, days to emergence of parents and F_1 and F_2 generations*

Line/crosses		Germination		Days to emergence					
				Normal			Slow		
		Per cent	Rate	7	8	9	15	16	17
E100y		78	10.2	30	40	8	–	–	–
H81-73		85	11.0	32	42	11	–	–	–
E100y(m)		76	4.8	–	–	–	24	40	12
E100y(m) × E100y									
	F_1	80	10.4	28	45	7	–	–	–
	F_2	78	8.8	182	316	97	40	131	24
	χ^2		P = 0.50 – 0.25 (Good fit for 3:1)						
H81-73 × E100y(m)									
	F_1	82	10.2	24	46	12	–	–	–
	F_2	80	8.9	160	362	90	35	129	24
	χ^2		P = 0.50 – 0.25 (Good fit for 3:1)						

Table 2 *Segregation for the character days to emergence in F_3 generation*

Cross	No. of F_3 families				χ^2 1:2:1	P
	Normal	Segregating	Slow	Total		
E100y(m) × E100y	18	27	15	60	0.9	0.70–0.50
H81-73 × E100y(m)	9	19	12	40	0.55	0.80–0.70

suggested that the days to germination in this mutant is controlled by a single recessive gene which has been designated as 'gr'.

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ISOLATION AND CHARACTERIZATION OF *AEROMONAS HYDROPHILA* SUB SP *HYDROPHILA* CAUSING HAEMOLYTIC DISEASE IN INDIAN MAJOR CARP, *LABEO ROHITA* (HAM)*

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INLAND fish culture has become one of the important and rapidly expanding enterprises in India. However, diseases caused by bacteria generally result in large scale mortality of fishes and consequently reduce the economic benefits of the fish farmers[1,2]. A majority of fish diseases are caused by *Aeromonas* and *Pseudomonas* group of bacteria[3]. Among the former, *Aeromonas liquefaciens* and *A. punctata* have been isolated and partially characterized[4,5]. Another *Aeromonas* sp causing epidemic dropsy among the Indian major carps was isolated, but the exact species was not characterized then[6].

In this report, we describe the isolation and characterization of *Aeromonas hydrophila* sub sp *hydrophila* from pond cultured rohu, *Labeo rohita* (Ham).

Over 65% mortality of *L. rohita* fingerlings (mean length 17.8 cm and wt. 58.5 g) was observed in an intensive fish culture pond. The affected fishes became lethargic, refused to feed and crowded at the water surface. The body colour became black and erythema was noted at the base of fins. In severely infected fishes, blood was found to ooze through the anal region. Some of the diseased fishes at this stage were observed to jump over the water surface in distress and then collapse.

The moribund fishes were collected carefully and brought to the laboratory and bacteria were isolated from body surfaces, internal organs like liver, heart, kidney and also from visceral fluid by serial dilution and plating technique. Four bacterial isolates were obtained. These were purified, subcultured and stored at 15±1°C in nutrient agar slants. Among these only one was pathogenic when reinfection test was performed using *Oreochromis mossambicus* as test fish. The symptoms of disease such as erythema at the base of fins and rectal bleeding were also noticed. The bacteria were reisolated from the infected fish and then characterized by employing standard methods as given in Bergey's Manual[7] and by Collins and Lyne[8].

The results of the physical and other cultural characteristics of this isolate indicate that the organisms were Gram-negative, motile and non-sporulating rods which occur singly. The size of the cells was 1.44±0.34 by 2.52±0.53 μ. In agar plates, the colonies were whitish, raised, circular, whereas in slants they were thin glassy, whitish and spreading with yellowish tinge. Growth was profuse at 37°C and moderate at 42°C. Under aerated conditions, the bacteria grew profusely and in 'still' culture condition, pellicle formation was noticed. The generation time at room temperature in aerated cultures was 71 min, whereas under 'still' culture conditions, the generation time became 103 min.

The results of biochemical tests given in table 1 indicate that the organism could be placed under *A. hydrophila*. It grew well in minimal medium although no growth was observed when nutrient broth was supplemented with 7.5% NaCl. This observation together with the positive results obtained in the production of H_2S from 2.5% peptone-water indicate that *A. hydrophila* isolate might belong either to the sub-species *anaerogenes* or *hydrophila* excluding the sub-species *proteolytica*. However, since the determinative test i.e. production of gas from glucose gave positive results, this isolate is placed under the sub species, *hydrophila*.

This is the first report from India of *A. hydrophila* sub sp *hydrophila* causing haemolytic bleeding and large scale mortality among the carp, *L. rohita* (Ham).

* Dedicated to Prof. S. Krishnaswamy, Vice-Chancellor, Madurai Kamaraj University in commemoration of his 60th birth anniversary, 1986.