although septate fibres are very common in the secondary xylem and phloem of many plants such as the species of *Vitis*[2]. The functional significance of the septa in 'septate' sieve tube elements is unknown.

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A COMPARATIVE STUDY OF AMMONIA EXCRETION BY *MASTIGOCLADUS LAMINOSUS* COHN AND *GLOEOCAPSA* SP

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IN cyanobacteria, glutamine synthetase (GS) is the major enzyme involved in the primary assimilation of ammonia[1] and its activity gets inhibited by the action of the glutamate-analogues L-methionine-DL-sulphoximine[2,3] (MSX) and 5-hydroxylysine[4]. Thus, when ammonia assimilation into organic nitrogen is prevented, a major portion of the newly fixed ammonia gets released[5].

The effect(s) of MSX on the cyanobacteria *Mastigocladus laminosus* Cohn and *Gloeocapsa* were investigated. GS from both the cyanobacteria is almost completely inhibited in presence of MSX even at 10 μM. This results in ammonia excretion for 6 days by the former and 13 days by the latter (figure 1a, b). While in the unicellular *Gloeocapsa*, MSX causes an irreversible inhibition of GS, in the filamentous *M. laminosus* inhibition of GS is relieved after 6 days owing perhaps to the dilution of the inhibitory effect during cell multiplication or transport of glutamine from the heterocysts. This inhibition of GS in response to MSX treatment is promising and offers possibilities for use of the cyanobacteria as mini-fertilizer plants in the field.

Nitrogenase activity decreases marginally on treatment with MSX (table 1). However, on transfer from light to dark, its activity is lowered by 90% and 50% in *M. laminosus* and in *Gloeocapsa* respectively. In

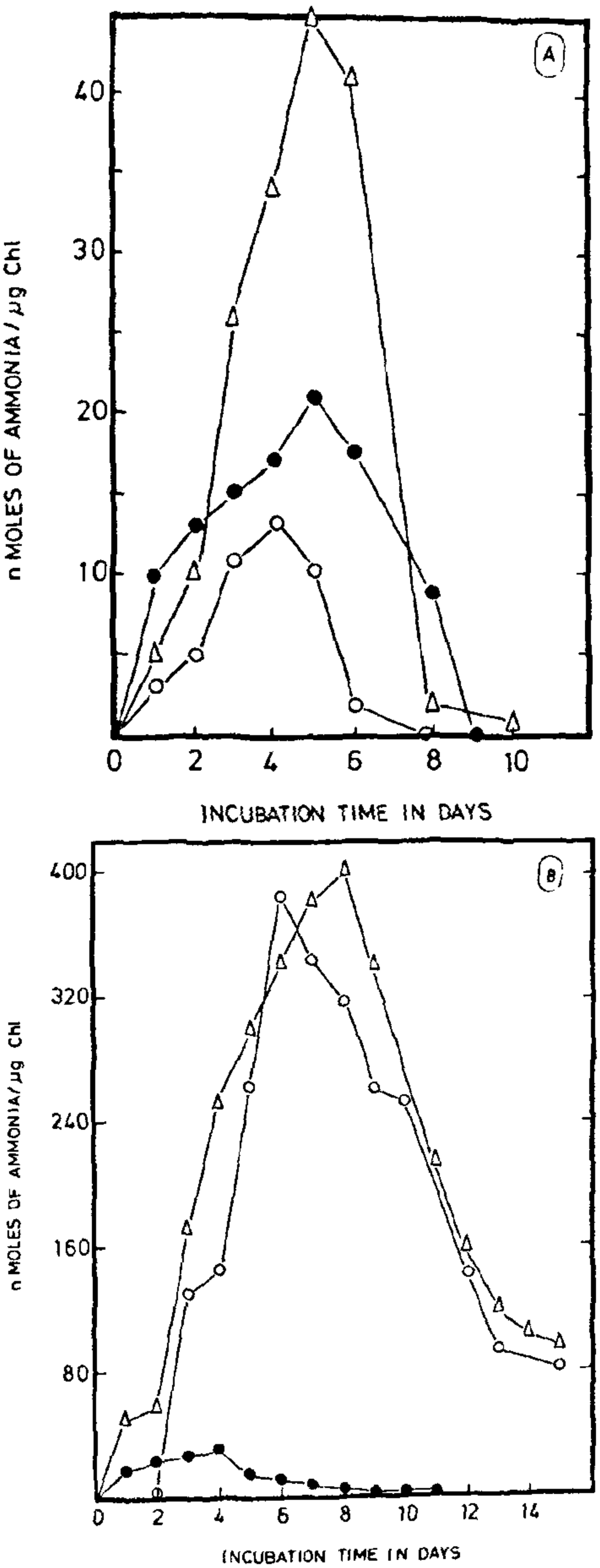

Figure 1. Excretion of ammonia by *M. laminosus* (A) and *Gloeocapsa* (B) in the presence of 10 μM MSX. ○ N-free, light. ● N-free, dark. △ NO_3^--grown, light.

Table 1 *Acetylene reduction by M. laminosus and Gloeocapsa.*

Assay condition		Organism *M. laminosus*	*Gloeocapsa*
Light (N-free)	− MSX	660*	88
	+ MSX (10 μM)	590	70
Dark (N-free)	− MSX	69	42
	+ MSX (10 μM)	62	32
Light	− MSX	Nil	26
	+ MSX (10 μM)	Nil (at 48 hr) (80 (at 72 hr)	20
$+NO_3^-$ (20 mM)	+ MSX (100 μM)	69 (at 24 hr)	21 (2 mM MSX)

*n moles C_2H_4 formed. mg Chl^{-1}. h^{-1}

Gloeocapsa, ammonia excretion in the dark is negligible while in *M. laminosus* the excretion rate is slightly more than in light indicating the operation of a catabolic process. MSX-treatment results in decreased oxygen evolution (table 2) and decreased reductant supply and this may account for the lowering in nitrogenase activity, since DCMU also completely cuts off acetylene reduction.

Combined nitrogen (20 mM NO_3^-) represses nitrogenase activity either partially as in *Gloeocapsa* or totally as in *M. laminosus*. *Gloeocapsa* may poorly assimilate MSX[6] since concentrations as high as 2 mM do not alleviate the repressive effect of nitrate on nitrogenase. The thick lamellated sheath induced by growth of nitrate[7] may also contribute to this poor assimilation. In *M. laminosus*, MSX effectively derepresses nitrogenase after 72 hr and 24 hr at 10 and 100 μM concentrations respectively.

It is thus obvious that the absence of combined nitrogen and the presence of light are prerequisites for effective ammonia production by *Gloeocapsa*. *M. laminosus* is efficient both in dark, and in presence of light and with combined nitrogen and hence, better suited for field applications. Its thermophilic nature is also an asset for its application in the tropical region as a suitable candidate to be used in the preparation of blue-green algal biofertilizer.

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A NEW SPECIES OF *ASCOGLENA* FROM INDIA

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DURING the studies on euglenoids from Bihar, a new species of *Ascoglena* Stein was collected. The organism was growing in Hinoo River at Ranchi and collected in the beginning of November 1977. The organism was found attached on the thalli of *Compsopogon coeruleus* (Balbis) Montagne. A perusal of literature revealed that this is a new species.

Ascoglena kumaraii sp. nov. (figure 1)

Lorica thick-walled, yellowish brown, more or less ellipsoid to cylindrical, slightly asymmetrical, with hind end sometimes narrower and the front end drawn out into an open slightly bent cylindrical neck provided with a narrow basal ring; cell only partially

Table 2 *Oxygen evolution by M. laminosus and Gloeocapsa.*

Assay condition		Organism *M. laminosus*	*Gloeocapsa*
Light (N-free)	− MSX	68*	221
	+ MSX (10 μM)	18	183
Light $+NO_3^-$ (20 mM)	− MSX	56	235
	+ MSX (10 μM)	22	120

*μl O_2 evolved. mg chl^{-1}. min^{-1}