Table 2 *Effect of heat shock on germination of akinetes and survival of vegetative cells of S. pascheri*

Temperature (°C)	Time (hr)	Akinete germination (%)	Vegetative cell survival (%)
0	1	100.0	100.0
0	2	96.5	92.0
0	3	88.0	76 5
0	6	27 6	20.3
0	12	15.0	8 7
0	24	10.0	0.0
0	48	3.1	0.0
0	72	0.8	0.0
0	96	0.0	0.0
45	1	100.0	94.0
45	2	95 5	87.0
45	3	86.3	70.0
45	6	56 2	28 0
45	12	35.1	0.0
45	24	21.5	0.0
45	48	12 4	0.0
45	72	9.1	0.0
45	96	1.0	0.0
45	120	0.0	0.0
50	1	14.3	0.0
50	2	6.2	0.0
50	3	3.2	0.0
50	6	0.9	0.0
50	12	0.0	0.0

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NEOTTIANTHE CALCICOLA (W. W. SM, SCHLECHT (ORCHIDACEAE): NEW TO THE FLORA OF INDIA

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MANY species which are either new to science or new records to the region have been reported[1-4] from India after J. D. Hooker published his Flora of British India (1872–1897). During extensive botanical explorations in the alpine regions of Kumaun Himalaya, some specimens of an interesting ground orchid were collected. Critical examination showed that these did not match with the description of any species occurring in India. A specimen was sent to Dr J. Renz, Basel, Switzerland, who identified it as *Neottianthe calcicola* (W. W. Sm) Schlecht belonging to Orchidaceae, originally described from China as *Gymnadenia calcicola* W. W. Sm. This species was recently reported from Nepal[5,6]. There is no published record regarding its occurrence in India and hence it is recorded in this note. A short description along with other relevant information is provided.

Neottianthe calcicola (W. W. Sm) Schlecht in Acta Horti. Gothoburg. 1:137, 1924; Hara, Stern & William in Enum. Pl. Nepal 1:49, 1978; Banerji & Pradhan in Orch. Nepal Himal. 82, Pl. 32, 1984. *Gymnadenia calcicola* W. W. Sm. in Notes Roy. Bot. Gard. Edin. 88:188. 1914.

Plants erect or slightly curved, 8–12 cm long. Leaves two, lanceolate or oblanceolate to sublinear, 4–8 cm long, obtuse to acute. Spike 4 cm long, 6–12 flowered, floral bracts ovate-lanceolate, smaller than the flowers but exceeding to ovary. Flowers secund, rose coloured. Sepals nearly 7 mm long, obliquely lanceolate, acute. Petals linear, 5 mm long. Lip about 7 mm long, three-lobed at the middle or near the base, lobes linear, mid lobes 3 mm long bent downwards. Spur 0.5 mm long, faintly incurved, apex contracted. Flowers and fruits, August to September. Frequent in alpine pastures between an elevation of 3000–3450 m in sheltered and well-protected rock crevices among mosses in Pindari (Almora district) and Chhiyalekh (Pithoragarh district). These collections are deposited in the Herbarium, D. S. B. College, Naini Tal with Herbarium No. 1510 and 1904.

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SOME RABI WEEDS—NEW HOSTS FOR *MELOIDOGYNE JAVANICA*

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DURING 1983–84, some Rabi weeds (*Dill* sp, *Lucas aspera*, *Rumex acetocella*, *Sisimbrium irio* and *Sonchus asper*) in the farmers' field were found to be having root-knot galls with numerous brownish pin head shaped egg masses. A large number of glistening white females of root-knot nematode was teased out under stereoscopic microscope and identified, on the basis of perineal pattern, as *Meloidogyne javanica*. The egg masses collected from these roots when kept at 25 ± 2° C for 24 hr gave out a large number of second stage juviniles of this nematode.

This is the first report of *Meloidogyne* on *Dill* sp, *L. aspera*, *S. irio* and *S. asper* in India or elsewhere, however *Meloidogyne* is recorded first time on *R. acetocella* in India.[1–3]

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INFLUENCE OF ROOT-INFECTING FUNGI ON DEVELOPMENT OF *GLOMUS MOSSEAE* IN GROUNDNUT

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INTERACTIONS between vesicular-arbuscular mycorrhizal (VAM) fungi and other soil microflora have been reported to occur[1]. In general, mycorrhizal plants that are attacked by pathogens suffer less damage and the incidence of disease decreases or the development of the pathogen is inhibited[2–4]. Some reports also indicate an increase in disease severity under the influence of VA mycorrhizal fungi[5,6]. However, there is very little information on the mycorrhizal development under the impact of root-infecting fungi.

Glomus mosseae (Nic & Gerd) Gerd & Trappe was shown to occur as a predominant VAM fungus in the laterite soil from our University campus[7]. Also, the root system of groundnut (*Arachis hypogaea* L) harbours two dominant root-infecting fungi, *Fusarium solani* and *Rhizoctonia solani*[8]. In the present study, therefore, an attempt has been made to determine the influence of *F. solani* and *R. solani* on the development of *G. mosseae* in groundnut.

The soil used was a latosol with 8.1 pH. The potting medium, consisting of a 2:1 soil:sand mixture, was taken in 20 cm earthen pots and autoclaved. This mixture was inoculated with *F. solani* and *R. solani*, and the mycorrhizal fungus *G. mosseae*. The root-infecting fungi, in the form of oatmeal-sand inoculum (2%, w/w) and the mycorrhizal inoculum (0.1%, w/w) in the form of dried and powdered groundnut roots colonized by *G. mosseae*, were mixed with the potting medium. The final inoculations were: *G. mosseae* alone; *G. mosseae* + *F. solani*; and *G. mosseae* + *R. solani*. Clean seeds of groundnut (cv TMV-2) were sown in all the pots. Three pots with a minimum of ten plants in each were retained for treatment. The plants were raised in open shade at an average temperature of 29 ± 4° C.

In another experiment, mycorrhizal inoculum was added during sowing but the root-infecting fungi were