NOTE

A New Record of *Bryum coronatum* Schwaegr. (Bryophyte) in Meghalaya, India

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ABSTRACT: The present contribution revealed the occurrence of *Bryum coronatum* Schwaegr. belonging to family Bryaceae (Bryopsida) for the first time in Teele Tura hills of west Garo hills, which is a new addition to the bryoflora of Meghalaya of north-eastern hills (eastern Himalaya). Critical details of the peristome of this species under SEM has been provided for the first time.

KEY WORDS: Bryophyte, *Bryum*, Garo hills, Moss.

INTRODUCTION

India is one of the twelve megabiodiversity centres of the world by having north eastern Himalaya recognized as hot spot amongst eighteen hot spots on the globe (Prance, 1995) showing considerably rich bryophyte diversity. The North Eastern Himalaya region of India has considerably rich bryological diversity. The diversity and richness of the floral wealth of eastern Himalayan region is due to the variable climatic conditions, habitat, geography and altitudinal variations. Meghalaya is a state in north-eastern India. It is a hilly strip in the eastern part of the country and is about 300 km long and 100 km wide, with a total area of about 22,720 sq km, lying between 24°58'-26°8' N and 89°47'-92°50' E. The state is bounded on the north by Assam and on the south by Bangladesh, comprises seven districts, namely, east Garo hills, east Khasi hills, Jaintia hills, Ri-Bhoi, south Garo hills, west Garo hills and west Khasi hills. West Garo hills are located in the western most part of the state of Meghalaya and cover a geographical area of about 3,714 sq km. It is bounded by the east Garo hills on the east, the south Garo hills on the south-east, the Goalpara district of Assam on the north and north-west and Bangladesh on the south. Tura hills are part of Siwalik hills. It is located at 25.52° N and 90.22° E (Fig. 1) and has an average elevation of 349 m. Tura hills are the highest part on the Garo hills region of the state.

Bryum coronatum was described from Guiana and Jamaica by Schwaegrichen (1816) but is known to have a rather wide distribution in the tropical to warm temperate parts of the world. The species is globally distributed in Bolivia, Borneo, Brazil, China, Japan, Java, Mexico, Peru, Philippines, Thailand and Taiwan. A perusal of literature reveals that this species is widely distributed in all the phytogeographical regions of India. Bartram (1955) while working on the mosses of north-western Himalaya and Chopra (1960) on the mosses of Nainital described the occurrence of *B. coronatum* from western Himalaya. Later on Vohra (1969, 1970) explored the moss flora of western Himalaya especially Garhwal Himalaya and reported this species. Gangulee (1974-78) made valuable contributions on the mosses of eastern India and adjacent regions and described twenty two species of *Bryum* including *B. coronatum* from different parts of the country. Stern (2000), during a tour of the state of Rajasthan, collected *B. coronatum* from extensive desert of Kumbhalgarh (Rajasthan). Vashistha (2007) reported the species from northern India and adjacent regions. Lal (2007) while working on the mosses of Gangetic plains reported this species from Calcutta, Howrah, Burdwan, Midnapore. Foreau (1964), Nair *et al.* (2005), Phatak *et al.* (2007), Daniels and Daniel (2007), Madhusoodanan *et al.* (2007) while working on the mosses of south India reported it from Idukki district of Kerala, Wayanad district (western Ghats), Rivona and Zambaulim area of south Goa, southern western Ghats and Eravikulam National Park (Kerala) respectively.

So far as the knowledge about moss flora of north-eastern Hills is concerned, and extensive-examination of literature reveals that exploration of bryophytes in Meghalaya was started by Gangulee (1969-1980), who worked on the mosses of eastern

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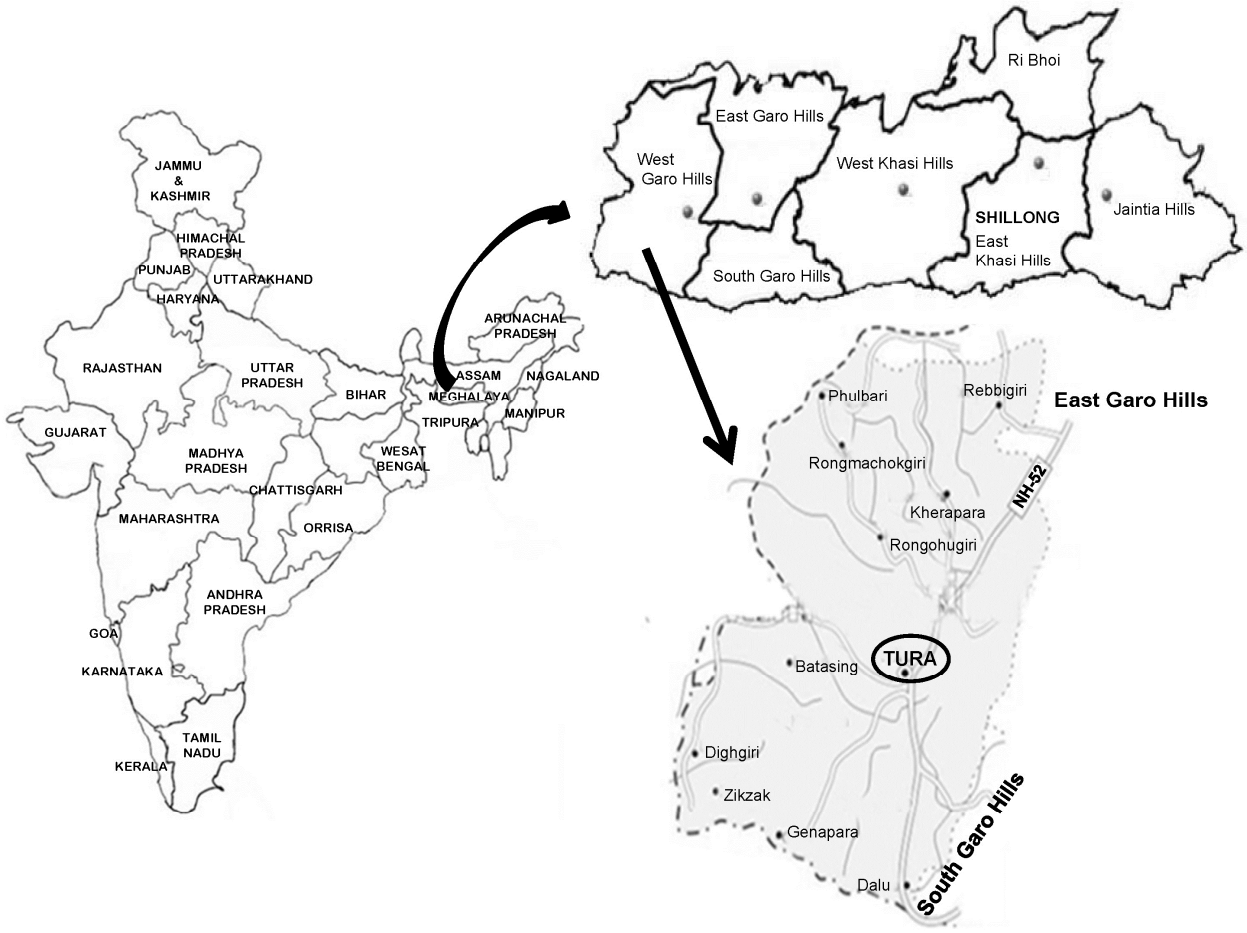


Fig. 1. Map showing distribution of *Bryum coronatum* in Tura, West Garo hills

India and adjacent regions and reported 248 species of mosses belonging to 120 genera from different parts of Meghalaya, mainly from Khasia hills. He reported *Bryum argenteum*, *Bryum medianum*, *Bryum caespiticium*, *Bryum alpinum*, *Bryum porphyroneuron* and *Bryum paradoxum* from Khasia hills, but there is no record of *B. coronatum* from Meghalaya (west Garo hills) previously. Recently during monographic studies on Indian taxa of the genus *Bryum* Hedw., some plants collected from Teele Tura hills of west Garo become a new record species for Meghalaya.

MATERIALS AND METHODS

The study is based on the specimens available at the Bryophyte Herbarium of the National Botanical Research Institute, Lucknow (India) and were earlier collected from the forest of Teele Tura hills, west Garo, at an average height of 410 m above sea level during September, 1999.

TAXONOMIC TREATMENT

Bryum coronatum Schwaegr. Sp. Musc. Frond., Suppl. 1(2): 103. pl. 71. 1816. Fig. 2

Plants very small, closely tufted, bright-dull green to yellowish-green above, dark brown below and in lower part matted with brown radicles, tomentose at base, rarely up to ±2 cm high. Stems slender, short, more or less erect, green, becoming reddish or brownish in lower portions, branched from base. Leaves numerous, more crowded and closer in the upper portion of stem, more distant below, erect to erectopatent, not greatly contorted when dry, slightly decurrent, 1.8-2.8 × 1.2-1.4 mm, imbricate, ovate to oblong-lanceolate, sharply acuminate; margins entire, flat; costa strong, red to reddish-brown, long excurrent in a ±0.5 mm long slightly denticulate arista; apical laminal cells thin to thick walled, narrowly hexagonal-rhomboidal, ±55-65 × 7-12 µm, narrower towards margin but without any clearly defined border, median laminal cells narrowly

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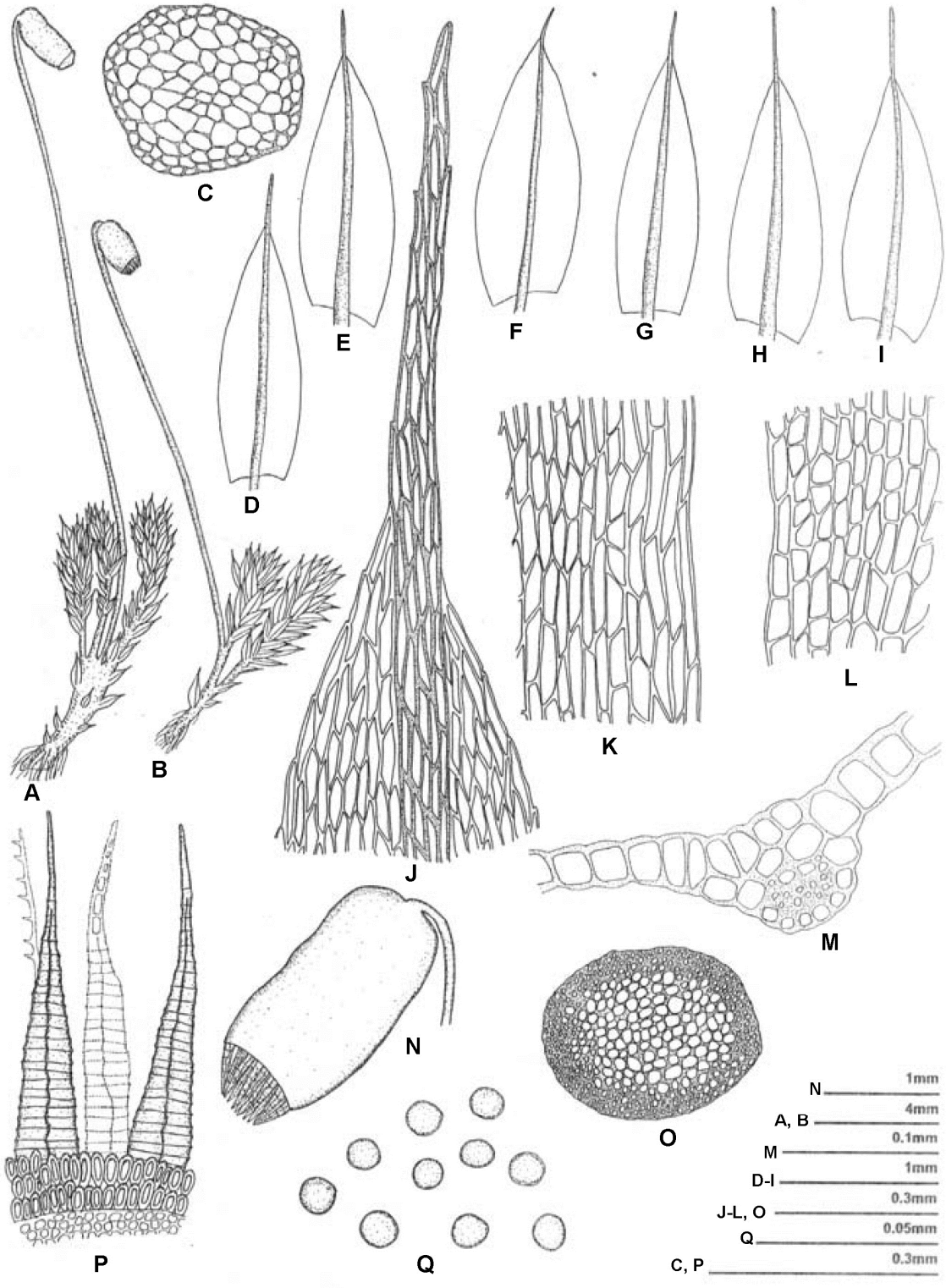


Fig. 2. Morphology of *Bryum coronatum* Schwaegr. A-B: Plants. C: Cross-section of stem. D-I: Leaves. J: Apical laminal cells. K: Middle laminal cells. L: Basal laminal cells. M: Cross-section of leaf. N: Enlarged view of capsule. O: Cross-section of seta. P: Peristome teeth. Q: Spores.

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rhombic to elongate-hexagonal, 30-60 × 9-16 µm, thin-walled, basal laminal cells broad and short-rectangular, thin walled, 35-45 × 15-22 µm. Seta slender, flexuose, apical, erect but arcuate at tip, 20-25 mm long, reddish-brown. Capsule thick, cylindrical, inclined to pendulous, dark red when mature, shaped like a cup in another cup with a short rounded neck, 2.0-2.5 mm long with the thick spongy apophysis; operculum convex-conical, apiculate with sharp point, shortly rostrate, dark red when mature; annulus present, with thick walled, irregular shaped, slightly elongated exothecial cells; peristome well developed, inserted close to mouth of capsule, exostome teeth dark brown-yellow, broad lanceolate, narrowing abruptly above into slender light coloured, hyaline, papillose apex, ±500 µm long, endostome transparent yellow, papillose, basal membrane high with 2 to 3 appendiculate cilia. Spores small, yellow, nearly smooth to minutely papillose, 8-9 µm in diameter.

Spore under SEM: Spore spherical to semispherical, 8-9 µm in diameter, yellowish green with regularly arranged short bacculate process, bacculae 0.3-0.4 µm high, depression on dorsal surface (Fig 3. A-B).

Peristome under SEM: Exostomial teeth conspicuously papillose via presence of prominent papillae on the ventral surface thus formed reticulate pattern of ornamentation on the dorsal surface (Fig 3. C-D).

Specimen examined: INDIA: Eastern Himalaya, Meghalaya, west Garo Hills, Forest Teele Tura Hills, alt. *ca* 410 m, on rocky soil near road, 19.09.1999 Leg.: A.P. Singh and M. Lal, *208101* (LWG).

DISCUSSION

Bryum coronatum Schwaegr. is a light green plant. Among the Indian species of *Bryum,* sterile plant of *B. coronatum* is more likely to be mistaken with *B. caespiticium*. but the latter can be easily recognized in having erect-erectopatent, oblong to ovate-lanceolate leaves with strongly revolute margin all along the length, costa excurrent with 0.2 mm long arista contrasting the former by leaves being ovate to oblong-lanceolate, sharply acuminate with entire, flat margins, costa more long excurrent in a ±0.5 mm long slightly denticulate arista. The species is also confused with *B. bicolor* in most of the morphological (vegetative) features, but can be distinguished by leaf shape and excurrency of costa. *B. bicolor* have concave leaves with excurrent costa and the bulbils have thick, triangular primordia with costa whereas *B. coronatum* leaves are relatively short and broad and gemmae are usually absent. A unique feature is the presence of capsule which shape like a cup in another cup along with strongly thickened apophysis which is almost inflated and distinctly rugose where-as capsule of *B. bicolor* is hemisphaerical to ovoid and apophysis is less thickened and more or less smooth.

An interesting feature of this plant is that quite unlike most mosses often affected by environmental changes, it persists in habitats within heavily populated human settlements irrespective of industrial emissions and its community is not easily amenable to decomposition after the completion of its annual growth cycle. The presence of *B. coronatum* in Meghalaya has further widened its range of distribution to eastern Himalayan region of India.

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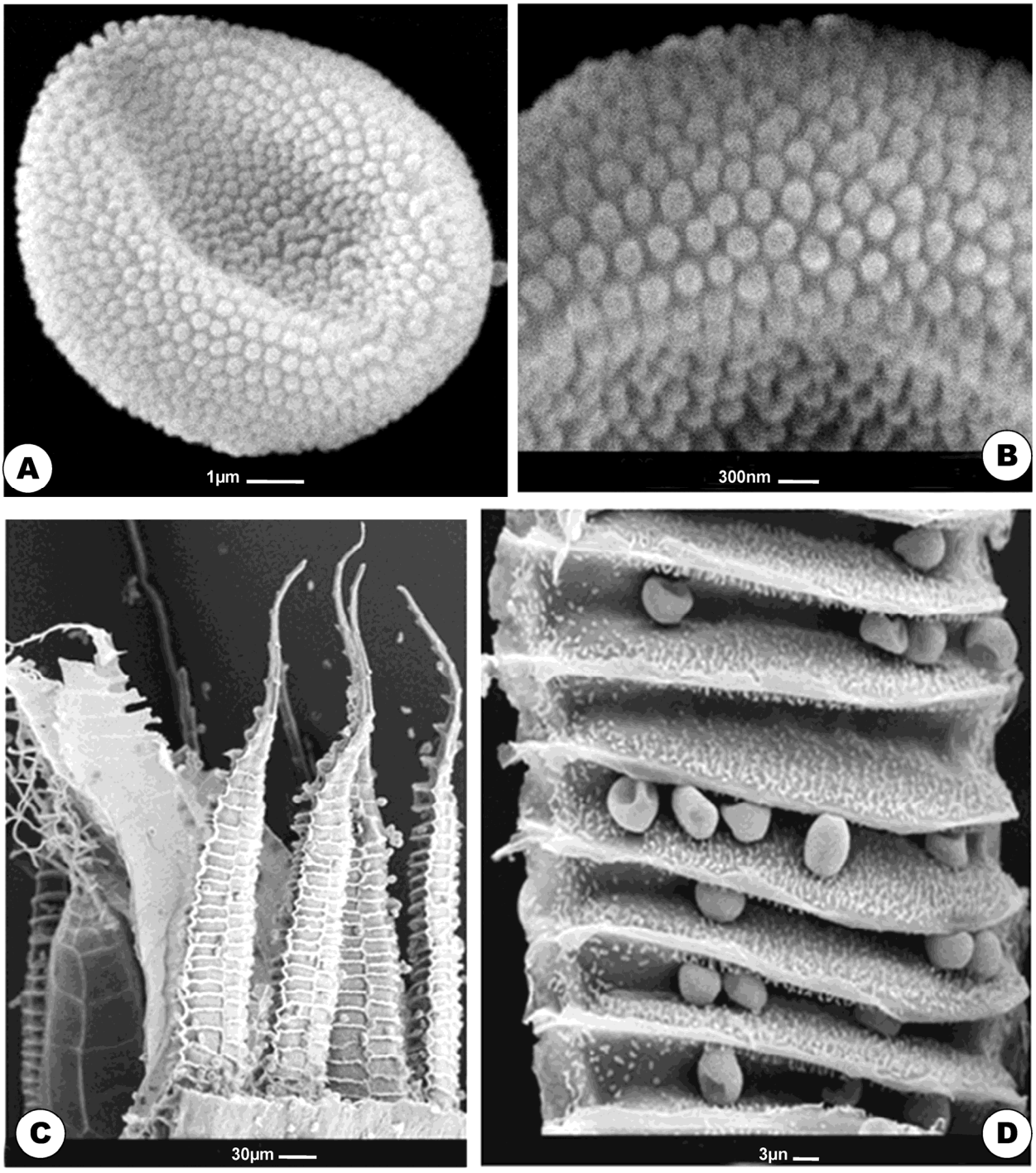


Fig. 3. A. Sporoderm pattern of *Bryum coronatum,* B. Enlarged view of a portion of spore. C. Exostome and endostome under SEM, D. Enlarged view of a portion of exostome.

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蕊形真蘚在印度梅加拉亞邦的新紀錄分佈

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摘要：本文首次報導蕊形真蘚 (蘚綱：真蘚科) 在印度西加羅丘陵的堤里圖拉嶺之新紀錄分佈，此新記錄的發現也為梅加拉亞邦的苔蘚植物誌增添新的一頁。本文也首次提出此物種蒴齒在電子顯微鏡下的細節。

關鍵詞：蘚苔植物、真蘚屬、加羅丘陵、蘚類。

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