**Jainiella**—A new dinoflagellate cyst genus from the Upper Cretaceous of Cauvery Basin, India

Khawaja-Ateequzzaman & Rahul Garg


A new dinoflagellate cyst genus *Jainiella* is described from Trichinopoly Formation (Upper Cretaceous), Cauvery Basin, southern India. It is characterised by subspherical to oval cyst having an autophragm without apical and antapical horns and possessing an intercalary, type 31 archaeopyle. The genus *Trilaluadinium* Islam 1983 is emended and *T. plenum* Islam 1983 is transferred to the new genus *Jainiella*.

**Key-words**—Palynology, Dinoflagellate cyst, Upper Cretaceous, Trichinopoly Formation, Cauvery Basin (India).

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**Systematic Description**

**Jainiella** gen. nov.

Type species—*Jainiella brevioriata* sp. nov.
Diagnosis—Autocyst subspherical to oval; proximate to proximochorate; parasutural features absent, archaeopyle intercalary, type 3I; operculum free.

Etymology—The genus is named after Dr Krishna P. Jain who has pioneered the study of fossil dinoflagellates in India.

Remarks—The new genus *Jainiella* is characterised by its hornless autocyst with intercalary, type 3I archaeopyle and in lacking apical and antapical horns (Table 1).

Islam (1983a, pp. 344-346) established *Trivaluadinium* with the following diagnosis: “Cyst peridinioid and rounded pentagonal to subspherical; horns, if present, vestigial; laterally to dorsoventrally compressed; proximochorate; cavate to narrowly circumcavate when possessing two mildly ornamented phragma; numerous or relatively fewer nontubular processes, solid, tubular or thinly tubular; archaeopyle intercalary type 3I/3I or 3I when an autocyst, operculum free, opercular pieces not found.” He designated *Trivaluadinium formosum* as its type species. In a subsequent publication (1983b, p. 90) he described another species *Trivaluadinium plenum* which is characterised by having autocyst with intercalary archaeopyle type 3I. He further remarked, “Generic assignment of the species been based on overall morphology and 3I archaeopyle, but this is an autocyst as against biphragmal *T. formosum*, the type of the genus. Generic reallocation of *T. plenum* n. sp. may therefore be necessary when appropriate.”

In view of the above opinion (Islam, 1983b, p. 90) it is apparent that cysts with two different types of wall structures (autocyst and biphragmal cyst) should be accommodated in two different genera. A new genus *Jainiella* is therefore erected to receive the single walled cysts (autocyst). Accordingly the genus *Trivaluadinium* is emended herein excluding the autocyst. *Trivaluadinium plenum* Islam 1983b (p. 90, pl. 4, figs 4-6) having autocyst is thus transferred to the new genus.

**Jainiella brevirostrata** sp. nov.

P. 1, figs 1-6

Holotype—P. 1, figs 1-2; Slide no. 10264; coordinates: 7.6 x 167; Trichinopoly Formation, Cauvery Basin. Upper Cretaceous.

Locality—0.5 km west of Kunnam Village, near Ariyalur, Tamil Nadu.

Diagnosis—Cyst small, proximate; subspherical to oval; apex broadly obtuse; antapex with two unequally developed lobes separated by a concavity; no parasutural features; surface ornamentation mixed type with closely

### Table 1—Comparative morphological features of *Jainiella* gen. nov. and related taxa

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<tr>
<td>Shape</td>
<td>Subspherical to oval, without horns</td>
<td>Compressed, peridinioid to rounded pentagonal or subspherical with short apical and two antapical horns present or absent</td>
<td>Compressed, peridinioid to subspherical with one short apical and two short antapical horns</td>
<td>Subspherical to ellipsoidal usually with one apical and two poorly developed antapical horns</td>
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<td>Wall Relationship</td>
<td>Autophragm only</td>
<td>Biphragmal, cornucavate to narrowly circumcavate</td>
<td>Biphragmal, cornucavate</td>
<td>Biphragmal, cornucavate possibly circumcavate</td>
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<tr>
<td>Wall Features</td>
<td>No parasutural features</td>
<td>Periphragm bears sparse to numerous solid or hollow, non-tubular processes; processes occasionally joined in pairs</td>
<td>Pandasutural bands smooth or granular, intratubular areas finely to coarsely granular</td>
<td>No parasutural features; endophragm variously ornamented with features of low to moderate relief, periphragm smooth or faintly ornamented</td>
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<td>Paratabulation</td>
<td>Indicated by archaeopyle alone</td>
<td>Indicated by archaeopyle alone</td>
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<td>Indicated by archaeopyle and Lent Paracingulum</td>
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<tr>
<td>Archaeopyle</td>
<td>Intercalary type 3I</td>
<td>Intercalary type 3I/3I</td>
<td>Intercalary type 3I/3I</td>
<td>Intercalary type 3I/3I</td>
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4', 5a, 7’ x c. 5", 2’’
PLATE 1

(All specimens magnified \( \times 750 \)).

1-6. *jainiella breviorzala* sp. nov.

1-2. Holotype specimen in dorsal high and dorsal low views respectively showing surface ornamentation and 3I intercalary archaeopyle with independently released attenuated hexa type 2a paraplate: Slide no. BSIP 10264; coordinates: 7.6 x 167.

3. Paratype specimen in dorsal high view showing archaeopyle suture: Slide no. BSIP 10264; coordinates: 12 x 122.

4. Paratype specimen in dorsal high view showing 3I intercalary archaeopyle with opercular pieces (1a-3a) released independently: Slide no. BSIP 10264; coordinates: 17.5 x 129.8.

5. Paratype specimen showing five sided intercalary paraplate ka: Slide no. BSIP 10264; coordinates: 16 x 135.5.

6. Paratype specimen showing broadly obtuse apex and antapex with two unequal lobes separated by a concavity: Slide no. BSIP 10264; coordinates: 25 x 126.9.

Paracingulum: Not discernible.

Parasulcus: Not discernible.

Dimensions:

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<th>Holotype</th>
<th>Range</th>
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<tr>
<td>Size of the cyst</td>
<td>50 x 44 µm</td>
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Comparison—*Jainiella breviorzala* sp. nov differs from *J. plenica* (Islam) comb. nov. in being a proximate cyst having low relief ornamentation, that includes coarse grana and very small processes (1-2 µm high). *J. plenica* is a proximochorate cyst possessing numerous non-tabular, thin, slender, solid, 3-10 µm high processes only.

Genus—*Trivalentinum* Islam 1983 emended herein

Emended diagnosis—Cyst peridinioid and broadly pentagonal to subspherical; proximochorate, biphragmal, narrowly circumcavate, horns, if present, vestigial; periphragm ornamented with numerous or relatively
fewer non-tabular processes; processes solid, tubular or thinly tubular; archaeopyle intercalary, type 31/31; operculum free.

Type species—*Trivalvadinium formosum* Islam 1983, p. 346: pl. 4, fig. 9.

**REFERENCES**


