Russula arunii
**Russula arunii** S. Paloi, A.K. Dutta & K. Acharya, sp. nov.

**Etymology.** Named after Arun Kumar Sharma, the founder of the Botanic Garden at the University of Calcutta, from where the specimen was collected.

**Classification — Russulaceae, Russulales, Agaricomycetes.**

*Pileus* 39‒68 mm diam, convex when young becoming broadly convex to aplane towards centre at maturity, surface viscid and smooth at early stages that often becomes slightly velvety when mature, semi moist to moist, translucent, cracked that often extends to the centre, disc greyish brown (5D3) to yellowish brown (5D4) when young, becoming light orange (5A4) to greyish orange (5B4) when old, margin pale orange (5A3), no colour change on bruising turns yellow (2B7) with KOH, reddish white (8A2) with guaiacol, negative in phenol, NH$_4$OH and SV, context c. 2 mm thick at the centre, gradually thinner towards margin (≤ 1 mm), yellowish white (1A2), turning pale yellow (4A3) when exposed, yellow (2A7) with KOH, reddish brown (8D5) with guaiacol, no colour change with NH$_4$OH, FeSO$_4$, SV and phenol. *Lamellae* c. 2 mm broad, adnected, entire, regular, white (1A1), even, concolorous, turns reddish brown (8D5) with guaiacol, negative in phenol and NH$_4$OH, lamellae of one series. *Stipe* 20–29 × 5–7 mm, central, cylindrical, more or less equal, white (1A1), smooth, moist, fleshy, no colour change on bruising, turns greyish yellow (4B3) with KOH, light brown with SV and high red (9B8) with guaiacol, context solid when young, becoming multi-chambered at maturity, white (1A1), turns light yellow with KOH and high red (9B8) with guaiacol. Taste acrid. *Odour* fishy-like. *Spore print* white.

*Basidiospores* (5.5‒)6–7.5‒(8.5‒)9.5‒9.9 µm) × (4.5‒)5.5–6(y.5‒)6.5 µm, Q = 1.07‒1.13‒1.16, globose to subglobose, ornamentation amyloid, composed of short (0.2‒0.5 µm) and long (0.7–1.0 µm) warts with obtuse to acute apex, connected with a line between three or more warts, often free from each other, forming incomplete reticulum, suprahilar spot amyloid. *Basidia* (32‒)36–40.1–44(–49) × (8.5‒)9.5‒9.9–10.9(–11.5) µm, clavate to subclavate, hyaline, thin-walled, oil droplets present when viewed with KOH, 4-spored, sterigmata 4.5–7 × 1–2.5 µm, cylindrical. *Hymenial cystidia* c. (50‒)53‒56(–61) × 7–8(–9) µm on gill sides, near gill edge c. 39.5–43(–48) × 6.5–7.5 µm, clavate to subclavate with capitellate or moniliform apex, hyaline, thin-walled, oil granule present when viewed with KOH. *Pileipellis* orthocromatic in cresyl blue, context composed of densely arranged sphaerocytes, c. 53.5–61 µm deep; subpellis non-gelatinous, c. 247–286 µm deep, composed of loosely arranged hyphae (measuring 1.5–3 µm wide), branched, oil granule present when viewed with KOH; suprapellis 79–122 µm deep, composed of erect to suberect hyphae with acute to obtuse apex, oliferous hyphae measuring 2.5–4 µm wide, more abundant towards pileus centre. *Pileocystidia* (17.5‒)19–20(–25.5) × 3–4 µm, abundant towards pileus centre, scattered to absent towards margin, 1-celled, mostly with capitellate apex, hyaline, thin-walled, base attached with nodular like cells. *Lamellar trama* composed of loosely arranged sphaerocytes, measuring 9–25.5 × 7.5–23 µm, thin-walled. *Subhymenium* pseudo-parenchymatous. *Stiptipellis* 41–63 µm thick, composed of 3.5–5.5 µm broad, branched, septate, hyaline hyphae, hyphal end subulate, oil granule present when viewed with KOH, caulocystidia abundant, clavate with capitulate apex, 2–3-celled, hyaline, dense with cytoplasmic contents. *Stipe trama* composed of almost subglobose sphaerocytes, measuring 14.5–34 × 10.5–26 µm.

**Typos.** *Inocia*, West Bengal, Kolkata, Botanical Garden of the Ballygunge Science College campus, 22°31’33.30” E98°21’43.50”, alt. 10.6 m, on the base of *Pterigota alata* (Stercariaceae). 28 July 2014, S. Paloi (holotype CUH AM261, ITS and LSU sequences GenBank KR872619 and KY946732, MycoBank MB819728).

**Additional specimen examined.** *Inocia*, West Bengal, Kolkata, Ballygunge Science College campus, 22°31’37.30” E98°21’43.50”, alt. 10.6 m, on the base of *Pterigota alata*, 2 Aug. 2015, S. Paloi & A. K. Dutta, CUH AM270, ITS and LSU sequences GenBank KY450661 and KY948733.

**Notes** — The combination of features such as a greyish brown or yellowish brown to greyish orange pileus with translucent margin, adnexed attachment of lamellae, white spore print, fishy-like odour, acrid test, and presence of oliferous hyphae and pileocystidia in the pileipellis undoubtedly place *Russula arunii* in subg. *Ingratula* (Sarnari 1998).

Being a good representative member of subg. *Ingratula*, the newly described species appears morphologically close to *R. pulverulenta*, *R. ventricosipes*, and *R. pectinatoides*. However, *R. ventricosipes* has a pale brownish to pink reddish brown or dark reddish orange pileus, negative reaction of the pileus surface with KOH, much longer basidiospores (7–13.6 µm) coloured pale orange yellow with ornamentation that are never partial reticulate (Shaffer 1972). *Russula pulverulenta* differs from *R. arunii* by its yellowish white to dark orange yellow or moderate brown lamellae, pileus surface that turns deep reddish orange to strong reddish brown with KOH, and dark yellowish green colouration of the pileus and stipe context with guaiacol (Shaffer 1972). *Russula pectinatoides*, commonly encountered throughout Europe and North America, has a much longer stipe (up to 50 mm), broader lamellae (4–7 mm) that are forked and interveined, nauseating odour of the pileus context, bitter taste, somewhat differently sized basidiospores (6.7–8.7 × 5.2–7.5 µm), and much longer hymenial cystidia (65–110 × 7–11.5 µm; Romagnesi 1987). The previously described Indian species *Russula dubdiana* differs by the stipe context that turns dark green with guaiacol, cream spore print, and absence of caulocystidia (Das et al. 2013) (MycoBank supplementary data).

**Colour illustrations.** India, West Bengal, vegetation cover of the collection site (background); left column: field photograph of the basidiocarp, fresh basidiocarp showing lamellae, SEM microphotograph of the basidiospore; right column: basidia, hymenial cystidia, caulocystidia (all from holotype). Scale bars = 5 mm (basidiocarp), 10 µm (microscopic structures), 1 µm (basidiospores).

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