One of the authors (VS) gratefully acknowledges the financial assistance from ICAR, New Delhi.

5 December 1986

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PHYTOPHTHORA ASSOCIATED WITH ARECANUT (*ARECA CATECHU* LINN) IN UTTARA KANNADA, KARNATAKA

M. N. L. SASTRY and R. K. HEGDE
Department of Plant Pathology, University of Agricultural Sciences, Dharwar 580 005, India.

KOLEROGA or fruit rot of arecanut is one of the major diseases responsible for huge losses in the plantations of Uttara Kannada. The pathogen was first named as *Phytophthora omnivora* De Bary[1] Coleman[2] described it as *P. omnivora* var *arecae* Coleman. Pethybridge[3] considered the fungus as *P. arecae* (Coleman) Pethybridge and observed it to be quite different from *P. omnivora*. Tucker[4] reported that *P. arecae* is a synonym of *P. palmivora* Butler, which attacks many plants belonging to Palmae, whereas, Waterhouse[5] recognized it as a distinct species. Thus, controversy and confusion have existed for decades regarding the taxonomic identity and nomenclature of *Phytophthora* isolate pathogenic on arecanut. Therefore, in the present investigation, detailed taxonomic studies of *Phytophthora* isolates obtained from Koleroga-affected arecanuts of different localities were undertaken to establish the exact identity of the pathogen.

Isolates of *Phytophthora* on arecanut were collected from 25 different localities of Sirsi, Siddapur and Yellapur taluks of Uttara Kannada. The standard technique[6] was used to isolate the fungus from rotted arecanuts on PVPH medium. Single hyphal tip isolations of the isolates were made and maintained on oat meal agar.

The morphology of the isolates with reference to mycelial, sporangial, chlamydospore and oospore characteristics was studied to establish the taxonomic identity of the fungus.

The sporangial and chlamydospore characters of the isolates were studied on carrot agar. The carrot agar plates (100 mm diam) were inoculated with 7 mm diameter inoculum discs and incubated at $25 \pm 1°C$ in the dark for 3 days, after which the cultures were exposed to continuous cool light of fluorescent lamp for 2 days. The cultures were then examined for sporangial production under a microscope. For the production of chlamydospores, the cultures on carrot agar were incubated in the dark for 30 days and then observed.

The isolates were grown either singly or in combination with compatible mating types on Ribeiro's synthetic medium with β-sitosterol to obtain reproductive structures and to study their characters[7].

The characters recorded were compared with the descriptions given for different *Phytophthora* spp in the tabular key[8].

The study of different characters of the isolates revealed that in all the cases hyphae were of uniform diameter ($6\mu m$), smooth without hyphal swellings and copiously branched. Sporangia developed on carrot agar in 3–5 days, but many more developed in

water, obpyriform, base rounded, papilla hemispherical, 25–70(48)×15–40(25) μm, length-breadth ratio 1·3:1 and caducous with a slender stalk 11–16 μm long and chlamydospores absent. The isolates were found to be heterothallic and produced oospores in dual cultures with the compatible mating type (A^2). Antheridia—amphigynous and 12×13 μm, Oogonia—spherical to pyriform and 26–45 μm, Oospore—aplerotic, 15–40 μm and wall 2–4 μm.

The above descriptions of sporangia, chlamydospores and oospores of *Phytophthora* isolates of arecanut resemble the descriptions given for *P. meadii* McRae in the tabular key[8]. The identity of the isolates is in conformity with that of the Commonwealth Mycological Institute, Kew, England. One of the arecanut *Phytophthora* isolates (PM 1) has been deposited at CMI (Herb. IMI 255066).

The present identification of Koleroga fungus from arecanut as *P. meadii* differs from its earlier identification as *P. arecae*.

The authors thank the Commonwealth Mycological Institute, Kew, Surrey, England for the identification.

19 September 1986

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SPANISH GROUNDNUT STRAINS WITH FRESH-SEED DORMANCY

P. S. REDDY, M. S. BASU, S. P. TIWARI, DEVI DAYAL and T. RADHAKRISHNAN
National Research Centre for Groundnut, Junagadh 362 015, India.

DORMANCY of seeds in groundnut (*Arachis hypogaea* L) is not found in Spanish and Valencia groups (subspecies *fastigiata* Waldron) in contrast to Virginia group (subspecies *hypogaea* Krap. et Rig.) where it is generally present. Lack of dormancy in the Spanish (bunch) group is a problem causing *in situ* germination and poor storability of seeds in pods. Although some Spanish cultigens were reported to possess a degree of fresh-seed dormancy[1,2], these have not been released for general cultivation so far except the variety TG-17 which was reported to possess a short dormancy of about 15 days[3]. A major breakthrough in this aspect was the development of a Spanish cultigen, CGS 1–19 (derived from a cross between Spanish J-11 and Virginia bunch Robut 33–1) which possesses a fresh-seed dormancy period of five weeks[4]. This cultigen has a good yield potential and is already entered in the All India Coordinated Trials as CGC-7. The present report concerns further gain in dormancy period of CGC-7 to a level hitherto not reported in Spanish groundnut.

The progeny in F_8 generation of the selection CGC-7 was planted for pre-release seed multiplication during the summer of 1984 at NRCG, Junagadh. The population exhibited differential germination. Some seeds germinated belatedly thereby indicating a difference in the period of dormancy. The late-germinating and normal plants were harvested and bulked separately. To break the dormancy, the seeds were sprayed with ethrel (2-chloroethylphosphonic acid) solution (500 ppm), sealed in polythene bags to avoid escape of ethylene gas and kept overnight. After a thorough washing, the seeds were sown in the field during the rainy season of 1985. Both the bulks were harvested during the second week of November 1985 and subsequently planted separately on 27 June 1986.

The normal bulk exhibited uniform and complete germination within 10 days after planting. In the selected bulk, however, the germination was staggered resulting in four categories of seedlings (table 1). In category A, the population germinated normally similar to that in the unselected bulk