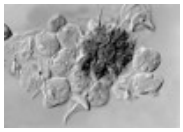
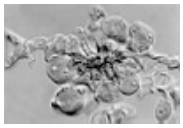
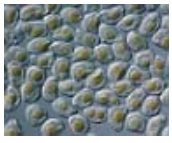
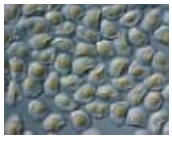
Coffee Leaf Rust - *Hemileia vastatrix*






Hemileia vastatrix Berk. & Broome, Gard. Chron. p. 1157. 1869.

Hemileia vastatrix causes coffee leaf rust, the most important disease of coffee worldwide. It was first discovered in the vicinity of Lake Victoria in East Africa in 1861, and later identified and studied in Ceylon (Sri Lanka) in 1867. The disease soon spread to much of southeast Asia and eventually throughout the southern, central, and western coffee-growing regions of Africa. Coffee leaf rust was not known in the western hemisphere until 1970 when it was found in Bahia, Brazil. The rust infects mainly leaves, but also young fruit and buds. Resistant varieties of coffee and fungicides are used to control the disease but have added to the cost of coffee production.

Spermogonia and aecia unknown.

Uredinia hypophyllous, small, 0.1 mm across, dense, scattered or in rounded spots from a few mm in early infections to several cm in older infections, giving a yellowish-orange powdery appearance, then changing to pale yellowish, centers of old pustules sometimes becoming necrotic, emerging through stomata, or rarely through epidermis, composed of clavate hyphae whose tips bear numerous pedicels on which urediniospores produced in clusters; urediniospores more or less reniform, 26-40 × 18-28 µm, wall hyaline to pale yellowish, 1-2 µm thick, strongly warted on the convex side, smooth on the straight or concave side, warts frequently longer (3-7 µm) on spore edges.

Telia hypophyllous, similar to uredinia, pale yellowish, teliospores often produced in uredinia; teliospores more or less spherical to limoniform, 26-40 × 20-30 µm diam., wall hyaline to yellowish, smooth, 1 µm thick, thicker at the apex, pedicel hyaline.

Hosts: *Coffea* (Rubiaceae). *H. vastatrix* is reported from South Africa on *Gardenia* (Rubiaceae) (Gorter 1981, Doidge 1950, Crous et al. 2000).

Geographic distribution: Africa, the Americas, Asia and Oceania, widespread wherever coffee is grown.

Although assumed to be heteroecious, the life cycle of *H. vastatrix* is not completely known. It is generally agreed that the rust does not complete its life cycle on the coffee tree, but no alternate host is known (Coutinho et al 1995).

Tea plantations were planted to replace the coffee plantations in Asia that were devastated by coffee rust in the late 19th century. This disease is thought to be responsible for the substitution of tea as the major social beverage of the English (Schieber & Zentmeyer 1984).

The western hemisphere remained free of coffee leaf rust until 1970 when the rust was accidentally introduced into Bahia, Brazil (Gottsberger 1971). Discovered on coffee plants growing near a cacao nursery, it probably came from Africa with coffee seedlings mixed with cacao seedlings (Hennen unpubl.). Since that time coffee leaf rust has spread to all major coffee-producing areas in the western hemisphere.

Two other rusts are reported on *Coffea*. *Hemileia coffeicola* Maubl. & Rogers on *Coffea arabica* L. and *Coffea* sp. is reported to be of minor importance. It affects coffee plantations in colder regions and is restricted to central and western Africa (Schieber & Zentmyer, 1984). Urediniospores of *H. coffeicola* are ornamented with larger, less numerous warts than those of *H. vastatrix* (Laundon & Waterston 1964a, Laundon & Waterston 1964b). In addition sori of *H. coffeicola* are scattered on the leaf surface whereas those of *H. vastatrix* are associated with leaf blotches which coalesce and become necrotic. *Aecidium travancoricum* T.S. Ramakr. is reported from South India (Ramakrishnan 1959) and produces spermogonia and aecia on *Coffea travancorensis* Wight & Arn.. Although not studied, there may be a possible connection between this rust and *Hemileia vastatrix* for which spermogonia and aecia are not known.