

Studies on tissue culture in sapindaceae

KUNDAN KISHOR RAJAK AND HARSH KUMAR

Accepted : December, 2008

Key words : Tissue culture, Sapindaceae, *In vitro*, Micropropagation, Litchi

Sapindaceae is a family of flowering plants found in temperate to tropical regions throughout the world. It includes many species of economically important fruits namely litchi, longan, pitomba, korlan, rambutan, mamoncillo, pulasan and ackee. Many species are lactiferous containing milky sap and saponins with soap like qualities and yield products including guarana, soapberries and maple syrup. Some species of maple and buckeye yield valuable wood, while others are popular ornamentals such as species of *Koelreuteria*, *Cardiospermum*, *Sapindus*, *Xanthoceras* and *Ungnadia*. Indian macassar oil is product of *Schlerichera trijuga*. The family members have not been much exposed to tissue culture studies. Shoot tip culture of longan cultivars resulted in multiple shoot formation and regeneration of virus free plants. Callus formation and somatic embryogenesis were observed from the cultured leaf and zygotic embryo explants of ackee. Tissue culture of litchi resulted in callus formation, somatic embryogenesis, multiple shoot formation, plant regeneration from different cultured explants including seed, leaf, stem, shoot bud, anther and protoplast. Micropropagation techniques were developed for guarana, litchi, longan and rambutan.

The Sapindaceae is a family of flowering plants. The species are found in temperate to tropical regions throughout the world, but are widely distributed in warm sub-tropics and tropics. Most of the species are native of Asia but some have their origin in South America, Africa and Australia. The family consists of more than 150 genera and 2000 species of mostly trees and Shrubs, but rarely herbs also. The family includes unique un-branched palm like tree such as *Talisia* and woody climbers namely *Sejania* and *Paullinia*. Many of the largest trees grow up to the height of more than 60m such as *Schleschese oleasa* and *Pometia pinata*. Litchi, the most important

fruit crop of North Bihar, is a member of the family. The members of the family have not been much exposed to tissue culture study. A compilation of tissue culture responses of important members of Sapindaceae including the important fruit litchi has been attempted.

Characteristics of sapindaceae:

The members of the family Sapindaceae have many common characters. The leaves are normally alternate, mostly pinately or palmately, sometimes single compound. Flowers are usually unisexual, borne in racemes, panicles or corymbs. There are usually four to five free, sometimes fused sepals and four to five petals (often with hairs), which may be absent, and a well-marked disc between the petals and stamens. There are eight to ten stamens in two whorls. The filaments are free and often hairy. The ovary is superior with two to four lobes, and the style is simple or divided. The fruits include capsules, nuts, berries, drupes, samaras or schizocarps, often red, containing seeds. They lack endosperm, with the embryo folded or curved.

Important plants of sapindaceae:

Many members of Sapindaceae are important plants having broad range of uses. Some plants contain saponin in their fruit, seed and other tissues. *Sapindus saponaria* and *Sapindus trifoliatius* are used as soap substitutes. *Schleichera trijuga* is the source of macassar oil, used in ointments. Maple syrup is yet another commercial product. *Paullinia cupana* is a vine plant and is the source of guarana, a soft drink used in many countries.

Some members of the family are important timber trees such as species of maple and buckeye, while others are popular ornamentals. Among ornamentals *Sapindus saponaria*, *Koelreuteria paniculata* are small trees. *Xanthoceras sorbifolia* is used for its attractive flower. Other ornamental plants are *Ungnadia speciosa* and *Cardiospermum halicacabum*.

Many economically important fruit plants are also included in this family namely *Blighia sapida*, *ackee*, a fruit with edible aril; *Melicocca bijuga*, mamoncillo or Spanish lime and *Pometia pinnata*, with an edible aril. Other fruit species of the family worth mentioning are *Cubilia bancoi*, Kubili; *Diploglottis cunninghamii*,

Correspondence to:

KUNDAN KISHOR RAJAK, Department of Agricultural Biotechnology and Molecular Biology, Faculty of Basic Sciences and Humanities, Rajendra Agricultural University, Pusa, SAMASTIPUR (BIHAR)

Authors' affiliations:

HARSH KUMAR, Department of Agricultural Biotechnology and Molecular Biology, Faculty of Basic Sciences and Humanities, Rajendra Agricultural University, Pusa, SAMASTIPUR (BIHAR)