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A STUDY OF ANTIFUNGAL ACTIVITY, ACID AND SUGAR CONTENT ETC. IN WOODAPPLE FRUIT IN RELATION TO FUNGAL DEVELOPMENT

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Unripe woodapple (Feronia limonia) fruit is generally free of visible fungal growth at harvest but a succession of fungi can be seen on the fruit shell during ripening depending on the storage conditions. Among the fungi isolated were five Aspergillus spp., Pencillium sp., Colletotrichum capsici, Fusarium spp., Mucor sp., yeasts and Botrydiplodia theobromae. Often Aspergillus spp. appeared first in the succession and B.theobromae last. Of these only B.theobromae and Mucor sp. entered into the pulp and often grew luxuriously converting the entire flesh to a black, dry mass.

Storage temperatures below 5°C prevented such fungal growth and dipping in hot water or benomyl and surface sterilization with $HgCl_2$ delayed fungal growth by eliminating the first three fungi in the succession.

Titratable acidity of the pulp was substantially high when unripe but decreased by about 50% during ripening. Reducing sugars on the other hand were present in very small amounts in the unripe pulp and increased by about five times during ripening. Such sugars in certain fruits leaked out forming a sticky layer on the surface.

Thin layer chromatography (Kieselgel 60 PF 254 merck; Chloroform: Methanol, 95:5) of outer tissue scraped from unripe fruit shell demonstrated the presence of four antifungal components : 2,3-dimethoxy benzoquinone[1] psoralene[2] and two other unidentified compounds at Rf 0.20 and 0.47. The amount of these compounds further increased during the first four days after harvest and then declined to low levels. Of these 2,3-dimethoxy benzoquinone and psoralene were more toxic to saprophytic fungi like Aspergillus and Penicillium than to pathogenic species[1,2].

The appearance of fungal flora in the ripe fruit (but not in unripe) may be attributed to the decline in the antifungal activity of the peel and perhaps to the increase of reducing sugars, which leaked out providing an easy substrate for these fungi.

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This work was supported by the International Foundation for Science, Sweden

References

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