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An Overview on Secondary Metabolites of *Annona muricata* Fruit and Their Pharmacological Activities

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Background: *Annona muricata* (soursop) is the most widely grown variety of more than 70 species of *Annona* which belongs to the family Annonaceae. Soursop fruits have been used in several traditional medicinal practices in the worldwide including diarrhoea, liver diseases, heart diseases and gut parasites. The fruit extracts are now being investigated to identify various beneficial pharmacological activities.

Objectives: To gather details on secondary metabolites of *A. muricata* fruit and their pharmacological activities, based on various research studies reported in the literature.

Methods: The published scientific literature was reviewed through the search engines of ScienceDirect, PubMed, Springer, and Google Scholar by following the keywords of “*Annona muricata*”, “secondary metabolites” and “pharmacological activities”.

Results: It was reported that *A. muricata* fruit contains acetogenins, alkaloids and phenolics as secondary metabolites. Annonacin is the predominant acetogenin reported in *A. muricata* fruit. Annonamuricin A, annonamuricin B, annonamuricin C, annonamuricin D, muricenin, muricin J, muricin K, muricin L, muricin N, *Cis*-annoreticuin, epomuricenins-A, epomuricenins-B, sabadalin, epomusenin-A, epomusenin-B, epomurinin-A and epomurinin-B are also reported in the fruit. Cinnamic acid derivatives and *p*-coumaric acids are reported in *A. muricata* fruit as the major phenolic compounds while caffeoylquinic acid, dicaffeoylquinic acid, dihydrokaempferol-hexoside, fisetin, kaempferol, kaempferol 3-O-rutinoside, luteolin- 3-7-di-O-glucoside, morin and myricetin were also reported additionally. Alkaloids that were identified from *A. muricata* fruit include annonaine, nornuciferine, asimilobine, N-methylcoculaurine and reticuline were reported. Essential oils, phytosterols and aliphatic compounds were also reported in *A. muricata* fruit pulp. Several *in-vitro* and *in-vivo* studies conducted to determine the pharmacological activities of secondary metabolites of *A. muricata* fruit were mentioned in the literature. Acetogenins had revealed the antioxidant, anticancer and antidiabetic activities. Phenolics have been reported for the antioxidant, antidiabetic, antimicrobial, anti-inflammatory, antiparasitic and antihypertensive activities. Phenolics were suggested as the major secondary metabolite responsible for the antioxidant activity of *A. muricata* fruit. Alkaloids reported to have antidepressive and cytotoxic activities. Antioxidant activity has also been reported by the essential oils of fruit pulp.

Conclusions: It is deliberated to sum-up that *A. muricata* fruit is rich in different secondary metabolites with known beneficial pharmacological activities.

Keywords: *Annona muricata*, Pharmacological activities, Secondary metabolites