

## PHYTOCHEMICAL ANALYSIS OF *TERMINALIA TOMENTOSA* (ROXB.) WIGHT & ARN.

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### ABSTRACT

*Terminalia* is the largest genus of family Combretaceae. In India, 17 species of *Terminalia* have been reported, which are mostly used as medicinal plants. *Terminalia tomentosa* (Roxb.) Wight. is a deciduous tree, having anti cancer, antimicrobial, antidiuretic, antibacterial and anti-inflammatory properties. Present communication deals with isolation of phytochemicals & bioactive compounds from ethanolic extract of bark & leaves of *Terminalia tomentosa*. The extract of bark and leaves were prepared using Soxhlet extraction; while further studies on phytochemical analysis of extract carried out at IIT, Mumbai by using HPLC-MS. The presence of alkaloids as Retronecine, flavonoids, glycosides, tannins as Sanguisorbic acid, metabolites as Quercetin 3-O-glucuronide and phenols were investigated from leaves and bark of *Terminalia tomentosa*. Important bioactive compounds obtained from leaves were Retronecine, Adenine, Sanguisorbic acid dilactone, Butoctamide hydrogen succinate, Forasartan, Manumycin A, Cloversaponin, Irinotecan, Euphorbin, etc.

**Key words** : *Terminalia tomentosa* (Roxb.) Wight & Arn., Phytochemicals, bioactive compounds, HPLC-MS

### Introduction

Plants are very important and essential for the functioning of all human being and play a major role in the function in gofeco system (Nadkarni *et al.*, 1978). Phytochemicals are the chemical compounds of plants which possess the medicinal role. More than 80% of the people in the world depend on traditional medicine for their primary health care needs (Mukherjee, 2002). *Terminalia tomentosa* (Roxb.) Wight. & Arn. synonym *Terminalia elliptica* Willd, the member of family Combretaceae is known to be a medicinal plant mainly due to its bark and leaves. This plant is commonly known as Indian Laurel or Crocodile bark tree,

The bark is astringent and useful in the treatment of ulcers, *vata*, fractures, haemorrhages, bronchitis and diarrhoea (Reddy *et al.*, 2017).

Its leaves are antifungal, antibacterial, antioxidant, anti leucorrhoeal, anti hyperglycemic and anti-inflammatory. Bark juice is applied to treat wounds, cut skin disease, diarrhoea, anaemia while gum is edible for stomach disorders. Pest of the leaves or its decoction is given for preventing vomiting, bark infusion in menstrual disorders, boiling or leaves decoction vapour to relieve headache.

The ethanolic extract of stem bark revealed the presence of carbohydrates (Alladi *et al.*, 2012), flavonoids, triterpenoids, steroids (Kumar *et al.*, 2021), tannins and saponins. Present investigation was undertaken to determine phytochemical components in stem, bark and leaves of *T. tomentosa* as indices of producing plant secondary metabolites which have medicinal values as well as industrial applications.

## Materials and Methods

The Bark and leaves of *Terminalia tomentosa* were collected on 1 February 2021 from Botanical garden of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, field no. 0111102. The plant was identified following Naik (1998) and Singh *et al.* (2000). The bark and leaves of *T. tomentosa* were dried in shade, and ground to a fine powder. The ethanol extract of the powder was then prepared by Soxhlet extraction, and used as a sample for High Resolution Liquid Chromatography –Mass Spectroscopy (HRLC-MS) at Sophisticated Analytical Instruments Facility (SAIF) at Indian Institute of technology Powai, Mumbai.

## Results and Discussion

The HRLC-MS analysis of ethanolic extract of *Terminalia tomentosa* leaves and bark revealed that they contained 80 and 49 compounds respectively, which can be employed to authenticate the species.

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**TableNo:01-Phytochemical analysis of the leaves of *Terminalia tomentosa*:**

Sr no.	CompoundName	Formula	Mass	RT	DB Diff	Group
1	Retronecine	C <sub>8</sub> H <sub>13</sub> N O <sub>2</sub>	155.0939	1.405	4.38	Alkaloid
2	Adenine	C <sub>5</sub> H <sub>5</sub> N <sub>5</sub>	135.0536	1.934	6.67	Sugar
3	Sanguisorbicdilactone acid	C <sub>21</sub> H <sub>10</sub> O <sub>13</sub>	470.0099	14.791	4.83	Tanin
4	Butoctamide hydrogen succinate	C <sub>16</sub> H <sub>29</sub> N O <sub>5</sub>	315.2032	15.194	4.31	Steroid
5	Quercetin 3-O-glucuronide	C <sub>21</sub> H <sub>18</sub> O <sub>13</sub>	478.073	18.281	3.61	Flavonoid
6	Forasartan	C <sub>23</sub> H <sub>28</sub> N <sub>8</sub>	416.241	18.882	6.38	Antagonist
7	Manumycin A	C <sub>31</sub> H <sub>38</sub> N <sub>2</sub> O <sub>7</sub>	550.2612	20.372	12.13	Natural Antibiotic
8	Cloversaponin 1	C <sub>36</sub> H <sub>56</sub> O <sub>9</sub>	632.3892	20.859	5.11	Saponin
9	Irinotecan	C <sub>33</sub> H <sub>38</sub> N <sub>4</sub> O <sub>6</sub>	586.2781	24.949	1.85	Inhibitor
10	Euphorin	C <sub>33</sub> H <sub>44</sub> O <sub>9</sub>	584.2975	25.603	1.71	Benzoate

**Table:2-Phytochemical analysis of bark of *Terminaliatomentosa*:**

Sr No.	CompoundName	Formula	Mass	RT	DB Difference	Group
1	EthylGallate	C <sub>9</sub> H <sub>10</sub> O <sub>5</sub>	198.0517	1.176	5.71	Metabolite
2	Isochamaejasmin	C <sub>30</sub> H <sub>22</sub> O <sub>10</sub>	542.1223	1.223	1.83	Flavonoids
3	—	C <sub>6</sub> H <sub>14</sub> O <sub>6</sub>	182.0781	1.248	5.17	Sugar
4	Melibiose	C <sub>12</sub> H <sub>22</sub> O <sub>11</sub>	342.1151	1.522	3.37	Sugar
5	Tiliroside	C <sub>30</sub> H <sub>26</sub> O <sub>13</sub>	594.1342	13.326	13.326	Glycosidic flavonoid
6	Diethyltoluamide	C <sub>12</sub> H <sub>17</sub> NO	191.129	191.129	13.584	Benzamide
7	Verbascoside	C <sub>20</sub> H <sub>30</sub> O <sub>12</sub>	462.1715	14.399	4.82	Glycoside
8	ProcyanidinB7	C <sub>30</sub> H <sub>26</sub> O <sub>12</sub>	578.1403	14.706	3.63	Catechins
9	Retronecine	C <sub>9</sub> H <sub>13</sub> NO <sub>2</sub>	155.0943	1.456	1.89	Alkaloid
10	Solanocapsine	C <sub>27</sub> H <sub>46</sub> N <sub>2</sub> O <sub>2</sub>	430.3517	17.348	9.83	Alkaloid
11	Glycerol	C <sub>35</sub> H <sub>67</sub> O <sub>8</sub> P	646.4484	19.489	13.84	Alcohol
12	Olprinone	C <sub>14</sub> H <sub>10</sub> N <sub>4</sub> O	250.085	15.011	1.93	Bipyridine
13	Butoctamide hydrogen succinate	C <sub>16</sub> H <sub>29</sub> NO <sub>5</sub>	315.2032	15.141	4.49	Amide
14	Armillarin	C <sub>24</sub> H <sub>30</sub> O <sub>6</sub>	414.2015	21.706	6.73	Terpenoids
15	Acetyl tributylcitrate	C <sub>20</sub> H <sub>34</sub> O <sub>8</sub>	402.2222	24.097	7.88	Carboxylic acid
16	Thiazopyr	C <sub>16</sub> H <sub>17</sub> F <sub>5</sub> N <sub>2</sub> O <sub>2</sub> S	396.0902	14.972	7.27	Pyridine
17	Sulochrin	C <sub>17</sub> H <sub>16</sub> O <sub>7</sub> C	332.0891	1.305	1.56	Metabolite
18	Malicacid	C <sub>4</sub> H <sub>6</sub> O <sub>5</sub>	134.0222	1.375	-4.78	Dicarboxylic acid
19	Gallicacid	C <sub>7</sub> H <sub>6</sub> O <sub>5</sub>	170.0223	3.274	-4.64	Pheniloc compound
20	Trichotomine	C <sub>30</sub> H <sub>20</sub> N <sub>4</sub> O <sub>6</sub>	532.1429	532.1429	-8.61	Carboxylic acid
21	GambiriinB1	C <sub>30</sub> H <sub>26</sub> O <sub>11</sub>	562.1532	12.457	-10.04	Catechin