

**AYURVEDA IS NOT A MERE HERBAL MEDICINE / FOLKLORE**  
**Does it offer new paths for Pharmaceutical Research?**

**By**

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Ayurveda is the mainstream health system for many Indians, for thousands of years <sup>1</sup>. Currently, there are over 400,000 registered Ayurvedic practitioners. There are also formal educational, professional, R & D and governance institutions and structures in Ayurveda, which regulate and oversee the quality and health care performance <sup>2</sup>. Notwithstanding this huge Indian base in Ayurveda, vested interests in the west are bent upon labeling Ayurveda as only another type of herbalism or folklore medicine. This has been criticized by Patel <sup>3</sup>, Pandey <sup>4</sup>, Gulati <sup>5</sup>, Chopra <sup>6</sup>, Vaidya <sup>7</sup> etc. Although alternative or complementary medicine is now gaining significant popularity in the west, Ayurveda is not at all given its due share, as a robust system of health care.

The prestigious medical journal – New England Journal of Medicine (NEJM) , December 19, 2002 issue – had addressed the important debate related to herbal medicines by publishing three articles <sup>8,9,10</sup>, but all these articles neither mentioned Ayurveda nor the important Ayurvedic plants of India. When an attempt was made to present facts through a letter to the Editor of NEJM, this was rejected without giving any reason. Another submission of a modified letter, requesting to reconsider their decision was also summarily rejected <sup>11</sup>. This obviously bespeaks of the western European and American arrogance. The world is currently witnessing this arrogance on other fronts of life and death. This selective but dogged undermining of India and her contributions by the US and UK is unfair. It is to the disadvantage of the western populace that the healing wisdom of India suffers such a prejudice by the US and European medical and pharmaceutical establishments <sup>12</sup>. On accessing the website of PUBMED of the US National Library of Medicine, with the keyword Ayurveda, one gets around 218 citations<sup>13</sup>. But if one puts the query on Complementary or Alternative Medicine or Herbals, there are thousands of references <sup>14</sup>. This prejudice against Ayurveda has to be handled by a careful strategy by the Indian Government, academia and industry. Then only Ayurveda will emerge as global medicine.

What criteria define a system of medicine/health ? Table 1 lists the differences between Ayurveda and herbalism/folklore, based on some criteria.

**Table 1**  
**Markers of a system vs a practice/folklore**

<b>Marker</b>	<b>Ayurveda</b>	<b>Herbalism</b>
Philosophical axioms	Shat – Darshanas <sup>15</sup>	Non existent
Nature of man	Katidha-purushiyam <sup>16</sup>	Tribal beliefs <sup>17</sup>
Roots and continuity	5000 years <sup>18</sup>	Discontinuities <sup>19</sup>
Authentic textbooks	Hundreds of books <sup>20</sup>	Mere compilations <sup>21,22</sup>
Academic institutes	Hundreds of centers <sup>23</sup>	Sporadic training <sup>24</sup>
Theories of pathogenesis	Tridosha-Saptadhatu <sup>25</sup>	Vague/demons/ancestors <sup>26</sup>
Prognostics	Sadhya-Asadhyata <sup>27</sup>	Uncertain indication <sup>28</sup>
Therapeutics	Rationale explained <sup>29</sup>	Empirical /faith <sup>30</sup>
Research & Progress	Significant research <sup>31</sup>	Sporadic /anecdotal <sup>32</sup>

The Indian and multinational pharmaceutical industry has often tried to grab “Herbal Remedies” from Ayurveda, without first grasping the fundamentals of the system. Despite these lacunae there have been some remarkable successes of Ayurvedic remedies, often labeled as herbals or dietary supplements <sup>33</sup>, in the west . Table 2 lists only some of these well-acclaimed or relatively unknown major discoveries that influenced the current global pharmacology and therapeutics, based more on the allopathic paradigms.

**Table 2**  
**Ayurvedic plants and global pharmacology**

<b>No.</b>	<b>Plant</b>	<b>Indication</b>	<b>Spin-offs and impact</b>
1	Rauwolfia Serpentina	Hypertension	Catecholamine depletion and new drugs <sup>34</sup>
2	Commiphora wightii	Hyperlipidemia <sup>35</sup>	Hepatic receptors & lipid changes <sup>36</sup>
3	Glycyrrhiza glabra	Viral infections	Viral DNA synthesis and transcription <sup>37</sup>
4	Plantago ovata	Constipation	Bowel regulators & lipid disorders

5	Psoralea corylifolia	Leucoderma	Thymine-adducts & PUVA therapy <sup>38</sup>
6	Aloe vera	Skin cosmetic/wounds	Wound-healing & MMPs <sup>39</sup>
7	Allium sativum	Hyperlipidemia	Sulfur pool & SH-interactions <sup>40</sup>
8	Curcuma longa	Cancer preventive	Alzheimer's disease amelioration <sup>41</sup>
9	Azadirachta indica	Skin infections	Antipest, antifeedant <sup>42</sup>
10	Zingiber officinale	Nausea/motion sickness	Gastric kinesis & motility <sup>43</sup>
11	Berberis aristata	Antiprotozoal	Intercalation with DNA <sup>44</sup>

We need not forget that the Ayurvedic dravya-gunas of these and other Indian plants offer a much wider scope for Indian pharmaceutical R & D. The paradigm of the current research has to change to Reverse Pharmacology – a path proposed and utilized by the pioneers in Ayurveda. Figure 1 shows the stages and approaches in Reverse Pharmacology. We must emphasize Ayurvedic Pharmacoepidemiology and robust clinical documentation of Ayurvedic therapy – non-drug as well as with drugs<sup>45</sup>. Such an approach, if committed to by the top management of the drug industry, can within five years make India a world leader in drug industry. We can cost-effectively corporatize Ayurveda as a mainstream system of medicine, with a global impact<sup>46</sup>. we need to synergise Ayurveda and Life Sciences, for products and services based on evidence.

Once the Indian Pharmaceutical industry takes up Ayurveda seriously, the new paths for products, prognostics, services and reparatives will certainly open up. But currently the Indian pharma industry leaders are only interested in R & D of the ME-TOO molecules. With the current resources at their disposal, this path is indeed fraught with hazards. One such example is recent debate of Reddy's antidiabetic compound which after an apparent success showed urinary bladder carcinogenesis in mice and rats<sup>47</sup>. The hype of Indian basic pharmaceutical R & D got a setback that was almost expected. The new paths which can be adopted are shown in Table 3.

**Table 3**  
**New paths for pharmaceutical research**

Fields	Ayurveda – leads	New paths
Aging and disorders	Kayakalpa &	Caloric deprivation &

	Rasayanas <sup>48</sup>	nootropics
Cancer and precancers	Induced regression <sup>49</sup>	Integrated management
Bronchial asthma	Shodhana & Shaman <sup>50</sup>	Autonomic modulations
Alzheimer's disease	Medhya Rasayanas <sup>51</sup>	IL-1 $\beta$ & Ach changes
Stress and depression	Adaptogens & Prasadana <sup>52</sup>	Hippocampal progenitors <sup>53</sup>
Hyperlipidemia	Guggulu and Pathya <sup>54</sup>	Hepatic lipid modulation <sup>55</sup>
Allergic disorders	Shodhana & Shirish <sup>56</sup>	Mast cell depletion <sup>57</sup>

The leads from Ayurveda either from Shodhana (purificatory) or Shaman (alleviating) therapy need to be pursued further by in depth medical research. The molecular mechanisms of Ayurvedic drug actions do offer a major challenge in Reverse Pharmacology<sup>58</sup>. The clinical effects of the entire plant or parts of it when understood, at the molecular or integrative levels, would provide truly novel paths for chemical drug development. These paths may involve combinatorial chemistry eg. 400 analogues of curcumin have been synthesized and are being screened. The high throughput screen or pharmacogenomics approach can be gainfully utilized. For this the targets are to be defined based on the clinical effects of the lead plant. Such a Reverse Genomics may yield totally new and rational targets for synthetic drug development<sup>59</sup>.

Ayurvedic and modern drug manufacturers, academic and pharma R & D laboratories and government research councils should evolve well-defined new drug development plans for selected and prioritized diseases. The Council of Scientific and Industrial Research (CSIR), under its New Millennium Initiative for Technological Leadership of India (NMITLI), has already evolved certain major projects based on Reverse Pharmacology and network R & D. It is desirable that the Indian drug industry takes major initiatives for a research focus on Ayurveda and not merely pursue the new chemical entities or me-toos. It is likely that the research on phytopharmacological actions correlates with the clinical effects of Ayurvedic therapy. Then Ayurveda would be truly understood as a system and not as a folklore.

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**FIGURE 1**  
**THE FLOW CHART OF REVERSE PHARMACOLOGY**

