INTRODUCTION
“drishta shruta anubutaanaam smaranat
smriti uchyate||”

Memory is the ability of an individual to record the information and recall it when needed. In Ayurveda, all cognitive functions are correlated to dhi, dhriti, and smriti. Dhi is nothing but medha, buddhi. Besides this, Ayurveda has given a novel concept of rasayanas i.e rejuvenating drugs that help in increasing the vitality of the body. Acharya Charaka has explained rasayanas that not only help in improving brain functions but also have overall rejuvenation of the body. They are known as medhya rasayanas which are four in number as follows:
1] Mandukaparni swarasa
2] Yashtimadhu churna along with ksheera
3] Shankhapushpi kalka
4] Guduchi kwatha

ABSTRACT
Ayurveda has a novel concept of rasayanas i.e the drugs that rejuvenate the body functions up to the molecular level. The concept of rasayana is not just revitalizing of tissues as Acharyas have classified them according to their peculiar actions on specific systems. Acharya Charaka has given a vivid explanation on four medhya rasayanas viz. Shankapushpi kalka, swarasa of Mandookaparni, Yashtimadhu along with milk and Guduchi kwath. In order to know the motto behind selection of these four drugs in their respective kashaya kalpanas as stated, we need to know their neuro pharmacological actions to elaborate the medhya karma. This short review highlights the properties of these dravyas in their specific kalpana.

Keywords: Medhya Rasayana, neuro pharmacology, Kashaya kalpana

DRUG REVIEW
A brief introduction of the four dravyas:
1] Mandukaparni:
Latin name: Centella asiatica Linn; Family: Umbelliferae; Synonyms: saraswati, divya, manduki; Gana: Charaka – vayasthapana, prajasthapana; Sushruta – tikta skandha Chemical constituents - Asiatic acid, asiaticoside, carotene, vallerine etc.
2] Shankhapushpi:
Latin name: Convolvulus pluricaulis Chois; Family: Convolvulaceae; Synonyms: mangalya kusuma, ksheerpushpi; Chemical constituents: Kaempferol, arecoline, convolvine
3] Yashtimadhu:
Latin name: Glycyrrhiza glabra Linn; Family: Fabaceae; Synonyms: Madhuka, klitaka; Gana: Charaka: Jivaniya, Kanytha; Sushruta: kakolyadi, Sarivadi, Anjanadi; Vagbhata: Anjanadi, Sarivadi; Chemical constituents: glycyrrhizin, liquiritin, glabridin, glycyrrhetic acid.
4] **Guduchi:**

Latin name: Tinospora cordifolia Willd Miers; Family: Menispermaceae; Synonyms: Amruta, kandarutha, chakrangi, tantriaka, etc. Gana: Charaka – vayasthapana, dahaprashamana, triptighna; Sushruta - guduchyadi, patoladi, valli panchmula; Vagbhata: guduchyadi, aravgadhadi; Chemical constituents: berberine, tinosporine, beta sitosterol.

**DICUSSION**

A] Ayurvedic pharmacology of these drugs:

When observed, it’s seen that all the four drugs are *madhura vipaki dravyas*. All are of *sheet virya* except *guduchi*. Medha is the *karma* given of prakrit *pitta*. This can be related to orientation and grasping power. *Guduchi*, being *madhura vipaki* and *ushna virya* can help in enhancing grasping power as its constitution is ideal for *karma* of *pitta*, especially sadhaka *pitta*. It can stimulate neuronal functions due to *pachana karma*.

The *madhura vipaki* and *sheeta virya dravyas* can help the function of *Tarpaka kapha* to go on smoothly owing to its constitution that is favourable for kapha *karma*. Dhruti i.e. *dharana shakti*, memory retention capacity which can occur in presence of only *sheeta virya*. Thus we see that though all the drugs are *medhya*, each exhibits different functions!

B] Need for the elaboration of *medhya karma*:

Now-a-days, a false marketing is in practise regarding the cognitive effects of these *medhya dravyas*. All of these are advertised as brain tonics and energy boosters and are blindly consumed especially in paediatrics. Over cautious parents who want their children to excel are among them. *Medhya dravyas* work at different levels on nervous system. This is an effort to throw light on this neuro pharmacological aspect.

We are persuaded to think why Acharya Charaka must have clubbed four of these in a group? They certainly must be beneficial collectively in a common nervous disorder! For this, we need to know their mode of action from modern point of view too. So, let’s have a look on the same:

1] **Guduchi**:  

The major constituent of *guduchi* is berberine which exhibits a peculiar action. It is isoquinolone alkaloid that has AChE (acetylcholinesterase inhibitory) action; similarly it is MAO – inhibitory. Berberine helps prevent oxidation damage to bio molecules of brain, reduces peptides that interfere with memory function and lowers lipids that hamper cerebral blood flow. Thus, *guduchi* arrests neuro degeneration which is commonly present in Alzheimer’s disease. Berberine reduces A beta levels by modulating APP (amyloid precursors) processing in human neuroglioma cells without toxicity. Hence it is *medhya rasayana* used in degenerative disorders.

2] **Yashtimadhu:**  

The major constituent useful in brain function is glabridin. Chemically it is a flavonoid polyphenol which is proven to attenuate cerebral injuries in stroke as it is neuroprotective. It is also proved in animal studies that it enhances memory retention. Thus it is useful mainly in Alzheimers disease.

3] **Shankpushpi:**  

Convolvulus pluricaulis species has been studied deeply. The constituent convolvine is responsible for blocking M2 and M4 cholinergic muscuranic receptors. It potentiates effects of arecoline, a muscuranic memory enhancer that ameliorates cognitive defects in Alzheimer’s.
4] **Mandukaparni:**

The constituent responsible is asiaticoside. Centella asiatica possesses this triterpene which is neuro protective and has anti oxidant properties. Thus, it can be said that all of these four dravyas are medhya with respect to their beneficence in neuro-degenerative disorders.

**Need to take these drugs in their specific kashaya kalpanas and anupana:**

a) **Guduchi:**

Guduchi kwatha is suggested for consumption. The reason behind this is that berberine is fixed only in the stem. So we get a proof as to why this particular bhaishyajya kalpana is given in texts because kwatha kalpana extracts the most from the stem compared to other kashaya kalpanas.

b) **Yashtimadhu:**

Charaka has suggested using yashtimadhu churna along with milk for medhya karma. It is probably because glabridin is an isoflavone that comes in hydrophobic extract of Glycyrrhiza glabra. In addition to this, being a phytoestrogen, its estrogen receptor binding function can be enhanced when consumed with milk. Phytoestrogens are known to arrest ageing and are neuroprotective.

c) **Shankhapushpi:**

Charaka has stated to take whole plant for medhya effect. The answer to this is convolvine is present in the whole plant. The extract of whole plant is proven to increase neuropeptide synthesis in brain protein content and increases acquisition efficiency.

d) **Mandukaparni:**

Charaka has mentioned to use it in the form of swarasa. In a study, it is proved that, leaf extract showed highest amount of asiaticosides than petioles and roots. Swarasa extraction is done mainly from leaves of any plant. Aqueous extract prevents cognitive defects and improves memory retention.

Here a question arises as to why brahmi has been excluded from this group? Actually it is a popular herb in cognition dysfunction. Mandukaparni possesses brahmoside which is content of brahmi (Bacopa monnieri). Also it has been said that mandukaparni should not be used with other sedative drugs as it can lead to synergism. Hence, this may be the reason why Brahmi might have been excluded from the group.

**CONCLUSION**

It can be concluded that Charakacharya must have designed this combination particularly in diseases of Smriti bhramsha. The rasa, veerya, vipaka of these dravyas are favourable for improving cognition defects. These four medhya rasayanas are thus of Naimittika type i.e. in specific disorders. So, we also get an idea of Naimittika medhya rasayana which exhibit certain organ-specific action related to disease. And after reviewing the neuro pharmacology of the concerned dravyas, we can opine that this group of dravyas is beneficial in Alzheimer’s disease in particular.

Secondly, regarding their use in different kashaya kalpanas and anupana, we can definitely say that for enhancement of their pharmaco therapeutic value our Acharyas must have stated so. Thus, we get a scientific background for our formulations.

**REFERENCES**

2. J.L.N. Shastry, Dravyaguna Vijñana Chaukhambha Orientalia, Varanasi
Ranade et al: neuro – pharmacological review on four medhya dravyas described by charaka


11. Yadavji Trikamji Acharya, Suśruta Sāmhitā, Niband Samgraha, Chaukambha Sanskrit Sansthan, Varanasi, 2010

CORRESPONDING AUTHOR

Dr. Anagha Ranade
Department of Dravyaguna,
Govt. Ayurved College,
Nanded, Maharashtra, India
E-mail: anagharanade11@gmail.com

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