

Comparative Study of Postpartum Therapeutic *Batisa* from Southern Rajasthan

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ABSTRACT Southern Rajasthan is region in rich therapeutic herbal medicines and is cautious about women and neonatal health. It uses various herbs for postpartum therapeutic foods among which is a 32 Herbal Composition Formulation, which forms an important recipe. The present study states the principle 45 ingredients of *Batisa* and composition of this formulation in *Ghee* or emulsified and alcohol media. Fifteen ingredients, that is, *Anethum graveolens*, *Areca catechu*, *Curculigo orchoides*, *Curcuma amada*, *Embelia ribes*, *Litsea glutinosa*, *Mesua ferrea*, *Myristica fragrans*, *Quercus infectoria*, *Rubia cordifolia*, *Sida cordifolia*, *Terminalia chebula*, *Tribulus terrestris*, *Trigonella foenum-graecum* and *Vitex negundo* are common to both alcohol and *Ghee* based *Batisa*.

INTRODUCTION

Pregnancy, childbirth, and postpartum are vulnerable stages, which may cause maternal death and they have special treatments and diets to the health adversities of this stages (Silalahi et al. 2020). Therapeutic diet or nutraceutical specifically display the holistic approach. It is meant for both, the physical and mental health state. The lactating mothers often undergo depressive states, and therefore their diet includes anti-depressants (Arora and Jain 2018). Along with feeding mothers or lactating mothers the childcare also becomes of utmost importance because it is influenced by the biochemical, physiological properties or breast milk (Hayat et al. 1999; Cervera and Ngo 2001; Abu-Saad and Fraser 2010; Opie et al. 2020). In the entire Indian subcontinent postpartum recipes with herbal formulations are popular and used by nearly all sub-groups of women in India and this is popularly known as *Batisa*. The herbal composition and the amount of ingredients though vary across casts and sub-casts depending open various socio-geographical and cultural factors (Dhillon et al. 2016).

In Rajasthan the state comprises various tribes, nomadic, semi nomadic and rural people. It is also a state of bravery reflecting through the Rajputana heritage where liquor form an im-

portant food and feed constituent. Therefore, in Rajasthan the postpartum 32 herbal formulation properly called *Batisa*, is prepared using an extract either in *Ghee* or emulsified medium or in alcohol (Goyal 2017; Deora and Rathore 2018; Dudi and Singh 2018). Depending open the active chemical consequents some herbs provide better results in alcohol-based formulation while others in emulsified medium.

Objectives

The objective of the current study encompassed documentation of the existing system of traditional knowledge of mother care and utility of medicinal plants related to postpartum and to identify commonalities in principles and elements practices during confinement, such as prescribed confinement period, postpartum diet, purpose of preparation ingredients, massage, herbal baths and medicinal tonic among mothers from different indigenous communities and rural areas of southern Rajasthan. The other target included poly-herbal formulation, which works on the synergistic effect of active principles of ingredients, for new mothers, which is safe, without any side effects, highly effective, reliable and optimum/adequate for better recovery and the treatment of health conditions related to confinement.

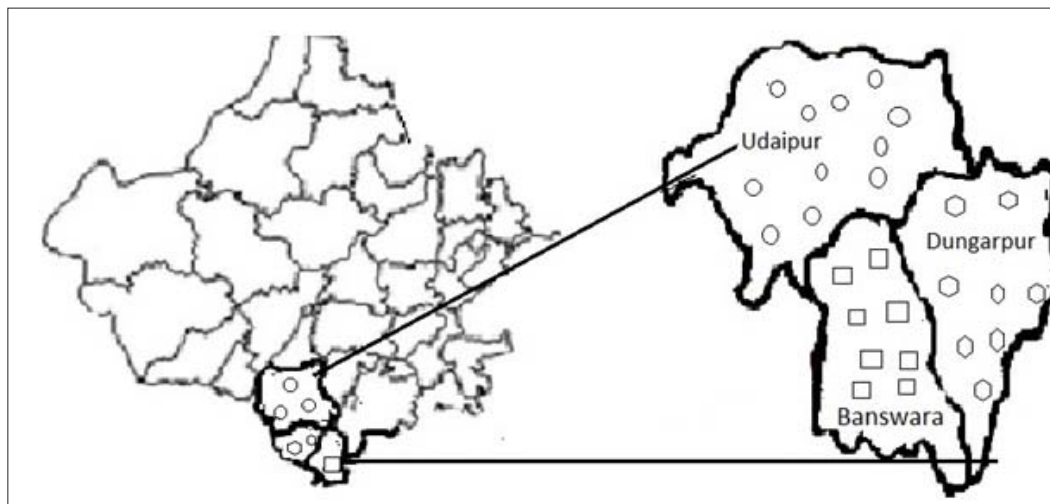


Fig. 1. Southern Rajasthan-Udaipur, Dungarpur, Banswara District

MATERIAL AND METHODS

Study Area

The present study was carried out from 2018 to 2020 at Banswara, Dungarpur, Udaipur in southern Rajasthan enquiring both rural and urban women from all communities including various tribes are shown in Figure 1.

Methodology

A total of 627 expecting and nursing mothers were interviewed among which 384 participants from the tribal community and 243 from the nontribal community were studied, and comprising 67 Hindu, 61 Muslim, 58 Sikh and 57 Christian women, who were interviewed similarly among tribal participants. 80 Meena, 73 Bhil, 76 Garasia, 79 Kathodia and 76 Damor women were included in the study is shown in Table 1. The

Table 1: Number of communities studied

<i>Tribal communities</i>	<i>No. of women</i>	<i>Non-tribal communities</i>	<i>No. of women</i>
Meena	80	Hindu	67
Bhil	73	Muslim	61
Garasia	76	Sikh	58
Kathodia	79	Christian	57
Damor	76		
Total	384		243

information was obtained in a consent form specifically for quantity deployed, which was nearly about 25 grams. Plants were also tallied in a criss-cross manner by using plants, specimens and their pictures. Herbarium sheets were prepared as per IRBN and were identified, numbered and deposited by the Department of Botany, B N University, Udaipur (Rajasthan) for future reference.

RESULTS AND DISCUSSION

Plants and herbs have been used for centuries as traditional medicines. Studies on medicinal plants assigned the therapeutic capacity of medicinal plants to their complex structure composed mainly from highly effective bioactive constituents. Generally plants contain more than one bioactive constituent and these constituents can be classified under different secondary metabolite groups, that is, terpenoid, phenolic acids, alkaloids, flavonoids, saponins, and tan-

nins. Depending on the basic core molecule or ring the solubility of the constituents varies considerably from polar to non-polar, and due to which the plants that are used in alcohol based homeopathy entirely differ from aqueous based Ayurveda. In traditional Indian therapeutic herbal practices, aqueous or fat/oil media based infusions, decoctions and extracts have generally been practiced as alcohol or liquor do not find an auspicious space in Indian culture though its use has been practiced in some tribal as well as non-tribal communities. In the Indian context, the other strong determining factor is the gender-based attitude, as liquor is not preferred among females. Despite maintaining such strong beliefs, liquor is used for the preparation of *Batisa* in non-tribal Rajput community and tribal of the Bhil, Meena and Garasia community, as they do not advocate for liquor but they practice its use, as they believe that some of the herbs show better results in liquor over aqueous or emulsified media. It can be related to biochemical sciences, which also aligns as the secondary metabolite exudation depends on the polar or non-polar nature of the molecule (Rastogi and Mehrotra 1993).

“*Batisa*” or a formulation of 32 ingredients is considered to be most important postpartum recipe, as it rejuvenates the entire biological system and cures postpartum associated maladies (Monterrosa 2017; Dudi and Singh 2018). The ethno-medicinal survey with respect to *Batisa* constituents and preparation methodology indicates two major preparation methods, that is, *Ghee* based *Batisa* and alcohol based *Batisa*. The differential uses of ingredients go with solubility of the active biomolecules (Khare 2007).

The choice of *Ghee* in preparation goes with preferably cow *Ghee* but in its unavailability commercial *Ghee* or clarified butter is used. Generally, local liquor or rum is used as a source of alcohol (Rao 2003).

Therapeutic ingredients added in these formulations are meant to deal holistically with the cure, rejuvenation and proper functioning of all systems, as many of the plants used in postpartum period possess high total phenolic content and are potent antioxidants (Jain et al. 2011).

Comparison of *Batisa* constituents in *Ghee* and alcohol reveal incorporation of overall 46 constituents, that is, *Aegle marmelos*, *Anogeis-*

sus latifolia, *Anethum graveolens*, *Areca catechu*, *Asparagus racemosus*, *Butea frondosa*, *Cholorophytum borivilianum*, *Cinnamomum zeylanicum*, *Cocus nucifera*, *Curculigo orchoides*, *Curcuma amada*, *Curcuma longa*, *Desmodium gangeticum*, *Embelia ribes*, *Euryale ferox*, *Gmelina arborea*, *Grewia tenax*, *Litsea glutinosa*, *Mesua ferrea*, *Mimosa pudica*, *Mucuna pruriens*, *Myrica esculenta*, *Myristica fragrans*, *Piper longum*, *Piper nigrum*, *Piper retrofractum*, *Quercus infectoria*, *Rubia cordifolia*, *Saccharum officinarum*, *Salmalia malabarica*, *Sida cordifolia*, *Smilax chinensis*, *Smilax glabra*, *Solanum indicum*, *Solanum surattense*, *Symplocos racemosa*, *Syzygium aromaticum*, *Terminalia chebula*, *Trachyspermum ammi*, *Tribulus terrestris*, *Trigonella foenum-graecum*, *Triticum aestivum*, *Vitex negundo*, *Vitis vinifera*, *Withania somnifera* and *Zinziber*. Among these constituents 36 are used in *Ghee* based *Batisa* of which four ingredients, that is, *Asparagus racemosus*, *Saccharum officinarum*, *Trachyspermum ammi* and *Triticum aestivum* are used as lactagogue, sweetener, appetiser and binding base material respectively, and therefore assist more in neonatal care, while the rest 32 ingredients are specifically deployed for maternal health, and hence the term *Batisa*.

Among the deployed 32 ingredients, 21 ingredients, as shown in Table 2 namely, *Aegle marmelos*, *Anogeissus latifolia*, *Asparagus racemosus*, *Butea frondosa*, *Cholorophytum borivilianum*, *Cinnamomum zeylanicum*, *Cocus nucifera*, *Euryale ferox*, *Grewia tenax*, *Mimosa pudica*, *Myrica esculenta*, *Piper retrofractum*, *Saccharum officinarum*, *Salmalia malabarica*, *Smilax glabra*, *Symplocos racemosa*, *Trachyspermum ammi*, *Triticum aestivum*, *Viti svinifera*, *Withania somnifera* and *Zinziber officinale* are specifically added only to *Ghee* based *Batisa*. These ingredients taste utmost bitter, and therefore to subsidise its bitterness the preparation goes with jaggery (*Saccharum officinarum*) and in rare cases sugar (Kumawat et al. 2021). In addition, jaggery also acts as a strong appetiser, which protects a nursing mother from bloating, flatulence and other digestive problems. The same purpose is also performed by *ajma* or *ajwain* (*Trachyspermum ammi*). *Trachyspermum ammi* also helps in cleaning the digestive tract and adds digestion to the neonatal stage. As all *Batisa*

Table 2: Comparison of *Batisa* constituents in *Ghee* and alcohol

S. No.	Ingredients-Botanical Name; Family (Local Name) Plant part used (Herbarium Accession No)	Ghee	Alcohol
1.	<i>Aegle marmelos</i> (L.) Corr. Serr.; Rutaceae (Bel) Fruit pulp (Bot/BNU/18-19/185)	50 gm	NIL
2.	<i>Anogeissus latifolia</i> (Roxb.exDC) Wall.exGuill.&Perr.; Combretaceae (Dhawda)Gum (Bot/BNU/18-19/55)	150 gm	NIL
3.	<i>Anethum graveolens</i> L.; Apiaceae(Suwa)Fruits (Bot/BNU/18-19/14)	50 gm	25 gm
4.	<i>Areca catechu</i> L.; Arecaceae (Supari) Nut (Bot/BNU/18-19/29)	100 gm	25 gm
5.	<i>Asparagus racemosus</i> Willd.; Asparagaceae (Shatavari)Roots (Bot/BNU/18-19/35)	100 gm	NIL
6.	<i>Butea frondosa</i> Roxb.; Fabaceae (<i>Kamarkas</i>) Bark (Bot/BNU/18-19/87)	10 gm	NIL
7.	<i>Chlorophytum borivilianum</i> Sant.&Fern.; Asparagaceae (Dholi musli) Tubers (Bot/BNU/18-19/36)	25 gm	NIL
8.	<i>Cinnamomum zeylanicum</i> Garcinex Blume Lauraceae(Dalchini) Bark (Bot/BNU/18-19/115)	25 gm	NIL
9.	<i>Coccoloba nucifera</i> L.; Arecaceae (Nariyal) Endosperm (Bot/BNU/18-19/30)	50 gm	NIL
10.	<i>Curculigo orchoides</i> Gaertn.; Hypoxidaceae (Kali musli) Tubers (Bot/BNU/18-19/112)	25 gm	25 gm
11.	<i>Curcuma amada</i> Roxb.; Zingiberaceae (Amba haldi) Rhizomes (Bot/BNU/18-19/215)	25 gm	25 gm
12.	<i>Curcuma longa</i> L.; Zingiberaceae (Haldi) Rhizomes (Bot/BNU/18-19/216)	NIL	25 gm
13.	<i>Desmodium gangeticum</i> (L.) DC.; Fabaceae (Fanda) Whole plant (Bot/BNU/18-19/95)	NIL	25 gm
14.	<i>Embelia ribes</i> Burm.f.; Myrsinaceae (Vai vidang) Fruits (Bot/BNU/18-19/132)	25 gm	25 gm
15.	<i>Euryale ferox</i> Salisb.; Nymphaeaceae (Makhana) Pop-corned seeds (Bot/BNU/18-19/136)	25 gm	NIL
16.	<i>Gmelina arborea</i> Roxb.ex Sm.; Verbenaceae(Sivan) Roots (Bot/BNU/18-19/211)	NIL	25 gm
17.	<i>Grewia tenax</i> (Forssk.) Fiori.; Tiliaceae (Gengchi) Fruits (Bot/BNU/18-19/210)	25 gm	NIL
18.	<i>Litsea glutinosa</i> (Lour.) CB Rob.; Lauraceae (Meda lakdi) Stem and Bark (Bot/BNU/18-19/116)	25 gm	25 gm
19.	<i>Mesua ferrea</i> L.; Calophyllaceae (Nagkesar) Flowers (Bot/BNU/18-19/47)	25 gm	25 gm
20.	<i>Mimosa pudica</i> L.; Fabaceae (Lajvanti) Roots (Bot/BNU/18-19/100)	25 gm	NIL
21.	<i>Mucuna pruriens</i> (L.)DC.; Fabaceae (Kemach/Kevach) Seeds (Bot/BNU/18-19/101)	25 gm	25 gm
22.	<i>Myrica esculenta</i> Buch-Ham ex Don; Myricaceae(Kayfal) Bark (Bot/BNU/18-19/130)	25 gm	NIL
23.	<i>Myristica fragrans</i> Houtt.; Myristicaceae (Jaifal) Seeds (Bot/BNU/18-19/131)	25 gm	25 gm
24.	<i>Piper longum</i> L.; Piperaceae (Pippali) Fruits (Bot/BNU/18-19/146)	NIL	25 gm
25.	<i>Piper nigrum</i> L.; Piperaceae (Kali mirch)Seeds (Bot/BNU/18-19/147)	NIL	25 gm
26.	<i>Piper retrofractum</i> Vahl.; Piperaceae (Choti pippal) Fruits (Bot/BNU/18-19/148)	25 gm	NIL
27.	<i>Quercus infectoria</i> Oliv.; Fagaceae (Majufal) Cones (Bot/BNU/18-19/110)	25 gm	25 gm
28.	<i>Rubia cordifolia</i> L.; Rubiaceae (Manjishta) Roots (Bot/BNU/18-19/183)	25 gm	25 gm
29.	<i>Saccharum officinarum</i> L.; Poaceae (Gud) JaggeryStem juice (Bot/BNU/18-19/164)	500 gm	NIL
30.	<i>Salmaliamal abarica</i> (DC.) Schott & Endl.; Bombaceae (Mochras) Bark (Bot/BNU/18-19/28)	25 gm	NIL
31.	<i>Sida cordifolia</i> L.; Malvaceae (Bala) Roots (Bot/BNU/18-19/121)	25 gm	25 gm
32.	<i>Smilax chinensis</i> L.; Smilacaceae (Chopchinni) Bark (Bot/BNU/18-19/193)	NIL	25 gm
33.	<i>Smilax glabra</i> Roxb.; Smilacaceae (Chopchinni) Roots (Bot/BNU/18-19/194)	25 gm	NIL
34.	<i>Solanum indicum</i> L.; Solanaceae (Kantkari) Seeds (Bot/BNU/18-19/197)	NIL	25 gm
35.	<i>Solanum surattense</i> Burm.f.; Solanaceae (Kanteli) Seeds (Bot/BNU/18-19/200)	NIL	25 gm
36.	<i>Symplocos racemosa</i> Roxb.; Symplocaceae (Lodha) Wood and Bark (Bot/BNU/18-19/205)	25 gm	NIL
37.	<i>Syzygium aromaticum</i> (L.) Merr. & L.M.Perry; Myrtaceae (Laung) Buds (Bot/BNU/18-19/133)	NIL	25 gm
38.	<i>Terminalia chebula</i> Retz.; Combretaceae (Choti/kali harar) Fruits (Bot/BNU/18-19/58)	25 gm	25 gm

Table 2: Contd...

S. No.	Ingredients-Botanical Name; Family (Local Name) Plant part used (Herbarium Accession No)	Ghee	Alcohol
39.	<i>Trachyspermum ammi</i> L.Sprague ex Turill; Apiaceae (Ajwain) Seeds (Bot/BNU/18-19/18)	50 gm	NIL
40.	<i>Tribulus terrestris</i> L.; Zygoplyllaceae (Gokhru) Seeds (Bot/BNU/18-19/219)	50 gm	25 gm
41.	<i>Trigonellafoenum-graecum</i> L.; Fabaceae (Methi) Seeds (Bot/BNU/18-19/107)	25 gm	25 gm
42.	<i>Triticum aestivum</i> L.; Poaceae (Ghuen) Kernels (Bot/BNU/18-19/168)	150 gm	NIL
43.	<i>Vitex negundo</i> L.; Verbenaceae (Nirgundi/ negad) Seeds (Bot/BNU/18-19/212)	25 gm	25 gm
44.	<i>Vitis vinifera</i> L.; Vitaceae (Munnaka) Fruits (Bot/BNU/18-19/214)	25 gm	NIL
45.	<i>Withania somnifera</i> (L.) Dunal; Solanaceae (Ashwagandha) Roots (Bot/BNU/18-19/202)	25 gm	NIL
46.	<i>Zinziber officinale</i> Roscoe.; Zingiberaceae (Sonth) Rhizomes (Bot/BNU/18-19/218)	25 gm	NIL

ingredients are roasted in *Ghee*, the fugitive effect of *Ghee* makes it difficult in swallowing the same. Therefore, addition of wheat flour (*Triticum aestivum*) helps in two ways. Firstly, it suppresses the effect of *Ghee* and secondly, it subsidises the bitterness of the ingredients. All the ingredients go with strongly recommended amount of 25 grams except that of a few ingredients, which have an additional role in metabolic milieu. Only the *Butea frondosa* bark popularly known as *kamarkas* is used in low quantities of 10 grams because it is believed to have very high thermogenic effects and hence higher quantities can harm nursing mothers (Opie et al. 2020). Plants extracted gums are rich in therapeutic polysaccharides as ghattic acid in *Anogeissus latifolia* and are therefore known for its healing properties and its use goes with 150 grams.

Healing properties of *Aegle marmelos*, *Areca catechu*, *Cocus nucifera* and *Tribulus terrestris* are attributed to the presence of urocoumarins, flavonoids, rutin, and marmesin in *Aegle marmelos*, alkaloids of the pyridine group, β -sitosterol, leucocyanidins, catechu (tannins, catechin, gallic acid) in *Areca catechu*, phenols (catechins, epicatechins, tannins, and flavonoids), triterpenes, steroids in *Cocus nucifera* and flavonoids, flavonol glycosides, steroidal saponins, and alkaloids in *Tribulus terrestris*, respectively. Due to such active components they are used in higher quantities at 50, 100, 50 and 50 grams, respectively (Ramawat 2009; Ramawat and Merillon 2013).

Alcohol based *Batisa* includes 24 ingredients instead of 32 (*Batisa*) among which 9 ingredients, namely, *Curcuma longa*, *Desmodium*

gangeticum, *Gmelina arborea*, *Piper longum*, *Piper nigrum*, *Smilax chinensis*, *Solanum indicum*, *Solanum surattense* and *Syzygium aromaticum* are exclusively used only in alcohol based *Batisa* and not added in *Ghee* based *Batisa*. They all are used in equal amounts, that is, 25 grams and are generally hard and solid in their appearance. Among these 9 ingredients, the *Piper* species is considered very significant. Piperine, the main bioactive molecule of *Piper longum* and *Piper nigrum* enhances the thermogenesis of lipid and accelerates energy metabolism in the body (Malini et al. 1999) and also increases the serotonin and beta endorphin production in the brain (Pawalia et al. 2020). It also acts as an immune-modulator, bio-enhancer and digestive stimulant, and therefore plays a prominent role in postpartum recovery (Sibeko and Johns 2021).

CONCLUSION

Fifteen ingredients, namely, *Anethum graveolens*, *Areca catechu*, *Curculigo orchoides*, *Curcuma amada*, *Embelia ribes*, *Litsea glutinosa*, *Mesua ferrea*, *Myristica fragrans*, *Quercus infectoria*, *Rubia cordifolia*, *Sida cordifolia*, *Terminalia chebula*, *Tribulus terrestris*, *Trigonella foenum-graecum* and *Vitex negundo* are common to both alcohol and *Ghee* based *Batisa*. Except *Anethum graveolens*, *Areca catechu* and *Tribulus terrestris* all the other 12 ingredients are used in equal quantity in both the mediums, while *Anethum graveolens* and *Tribulus terrestris* are used in twice the quantity in *Ghee* while *Areca catechu* is used in four times the quantity. These can be

due to less efficacy in fat solubility, and so they are deployed in larger quantities, while for the others the active bioactive principle components in the ingredients may have equal activity in both solvents.

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