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Traditional Medicinal uses of Animals as Complementary Medicines in the South-East Part of Rajasthan, India

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ABSTRACT

The present zootherapeutic study describes the traditional knowledge related to the use of different animals and animal-derived products as medicines by the people reside in the south-east part of Rajasthan, India. The field survey was conducted in four selected areas of Rajasthan by performing interview through structured questionnaire with selected informants, who provided information regarding use of animals and their products in folk medicine. 30 animal species were recorded and they are used for 45 different ethnomedical purposes, including cough, asthma, tuberculosis, paralysis, earache, herpes, weakness, muscular pain etc. Of the total 30 animal species reported 18 (60%) included in IUCN red data list and 7 (23%) are listed in CITES appendix I, II, and III. Many protected animals are also mentioned as important medicinal resources. We would suggest that this kind of neglected traditional knowledge should be included into the strategies of conservation and management of faunistic resources. Further studies are required for experimental validation to confirm the presence of bioactive compounds in these traditional remedies and to emphasize more sustainable use of these resources.

Keywords: Traditional Medicine, Body pain, animal product

BACKGROUND

The Traditional medicine (TM) is a comprehensive term used to refer both to systems such as traditional Chinese medicine, Indian Ayurveda and Arabic Unani medicine, and to various forms of indigenous medicine. In Traditional Chinese Medicine (TCM), more than 1500 animal species have been recorded to be of some medicinal use [CNCTHM, 1995]. In India, nearly 15-20 percent of the Ayurvedic medicine is based on animal-derive substance [Unnikrishnan, 1998]. In Unani system of medicines about 200 drug of animal origin are described which are claimed to be beneficial for the treatment of the various ailments [Sharma M P, 1996]. In the Ayurveda there is description of use of several animal based drugs particularly from cow, buffalo, camel, ass, goat and sheep [Pandey, 1996].

World health organization estimates that as many as 80% of the world's more then six billion people rely primarily on animal and plant based medicine [WHO, 1993]. The investigation of traditional medicines has proven a valuable tool in the developing art of bioprospecting for pharmaceutical compounds. The World Health Organization has selected 252 essential chemicals of which 11.1% are derived from plants, and 8.7% from animals (Marques 1997).

Today much is known about the phytochemistry and phytopharmacology of traditional medicinal plants, but the bio-scientific evaluations of remedies of animal origin substances are still quite rare. So there is an urgent need to inventorise and record all ethnobiological information among the different ethnic communities before the traditional cultures are completely lost. Therefore, ethnobiologist have a greater responsibility not only to record the traditionally used biological resources but also in conserving biodiversity. Therefore, this field surveys in south-east Rajasthan of India has been conducted to document the traditional knowledge of treating human ailments using different animals and their product.

STUDY AREAS

The state of Rajasthan is located in the north- western part of India. Its geographical location is between 23o 3` to 30o 12` north latitude and 69o 30` to 78o 17` east longitude with the tropic of cancer passing through the southern most tip of the state. An ethnozoological study has been conducted in south-east part of Rajasthan, which include four major areas of this region. *Ranthambhore national Park, Sawai Madhopur* is major forest in this area. The informations were mainly collected from *Meena, Mogya, Bawaria, Mali, Gujjar, Nath etc community* people, who are living in the villages, which located nearby the national park. The second study area was *Baran* Districts, where *Saharia* tribe constitutes the bulk of population and being located in the *Kishanganj and Shahbad Panchayat Samiti*. The *Saharia* do farming and cattle breading. They are non-vegetarians and eat the flesh of goat, sheep and birds. *Saharia* tribe has been major informants living in this area. *Kota* and *Bundi* District form the major part of *Hadoti* region. Other areas where the study has been concentrating were *Darrah Sanctuary, Kota and Ramgadh Vishdhari Sanctuary, Bundi*. The informations were collects from people living nearby these sanctuaries.

METHODOLOGY

Interviews were conducted with people to gather information about ethnozoology. Field materials utilized during our interview sessions included field notebooks, writing utensils, semi-structured questionnaire, micro cassette recorders, micro cassette tapes, and cameras.

The questionnaire was prepared for producing ethno-medicinal information. Because tribals are illiterate, so it was not possible for them to fill up the questionnaire, Therefore information were recorded in cassette recorder or any other possible method. Besides we used local mediators who translate the local dialect.

Fidelity level (FL)

Fidelity level (FL) demonstrates the percentage of respondents claiming the use of a certain animal for the same major purpose and was calculated for the most frequently reported diseases or ailments as:

$$FL\ (\%) = \frac{Np \times 100}{N}$$

Where *N*p is the number of respondents that claim a use of a species to treat a particular disease, and *N* is the number of respondents that use the animals as a medicine to treat any given disease (Alexiades, 1996).

The valid scientific names with author's names of the animal's species are included in the database. The conservation status of the animal species follows IUCN and CITES.

RESULTS

Zootherapeutic information's obtained from the field surveys of all the four study areas of south east Rajasthan are summarized in Table (1). The *informants* have been provided all the information regarding local name of the animal, part or product used to cure which ailment and method of preparation. In this study, we identified 30 animal species, which are being used for 45 medicinal purposes [Table 1, 2]. These animals are used as whole or body part or byproduct like milk, blood, organ, flesh, antler, feather etc. for the treatment of different kind of human ailments including cough, asthma, tuberculosis, paralysis, earache, herpes, weakness, muscular pain etc.

We have classified all the medicinal usage of animals in 14 major disease categories i.e. Antidote, Burn, Eye and Ear, Gastric disorder, Gynecological problems, Impotency, Nervous System, Pains, Respiratory Problem, Skin related Problem, Urinary Problem, Weakness and Wound healing. These categories are forms to show all related health problems in a major group

Six type of mode of administrations are reported in this study i. e. oral, topical, ophthalmic, ocular, anal and nasal. Oral administration is reported in 22 medicinal usages and topical administration is reported in 16 usages.

ANALYSIS OF RESULT

23 animals are reported for 29 therapeutic purposes by the Informants of Ranthambhore national park. These animals are used as whole or body part or byproduct like milk, blood, organ, skeleton etc. for the treatment of different kind of ailments including tuberculosis, asthma, paralysis, jaundice, earache, constipation, weakness, snake poison etc. The Saharias reported a total of 15 animal species for 19 different ethnomedical purposes, including cough, asthma, tuberculosis, paralysis, earache, weakness, muscular pain etc. 18 animal species are reported for 24 therapeutic purposes by the informants of the Darrah sanctuary. The informants of Ramgarh sanctuary area reported 17 animal species are usage for 21 medicinal purposes. 30 animal species are reported for 45 medicinal usage in south east Rajasthan by ethnic communities.

Table 1— Traditional medicinal usage of animals and their products in different disease categories as reported by ethnic communities of South-East Rajasthan.

English Name	Scientific Name	Local Name	Part used	Informants reported				medicinal use/ mode of administration	Method of preparation	Related reported areas
				Ranthambhore N=(30)	Baran N=(21)	Darrah N=(20)	Ramgarh N=(20)			
Antidote										
1. Cow	*Bos taurus (Linnaeus, 1758) Synonym- Bos indicus*	Gai	Ghee	5				Snake poison / oral	250gm Ghee + 100gm Black pepper mixture given orally to neutralize snake poison.	Ranthambhore
Burn										
2. Hard shelled Turtle	*Kachuga tentoria (Gray, 1834)*	Kachhua	Carapace		6			Burn/ Topical	Ash of carapace mix with coconut oil and use for burn.	Baran
Eye and Ear problems										
3. Indian Peafowl	*Pavo cristatus (Linnaeus, 1758)*	Mor	Leg	7	6	6	5	Ear infections / ocular	Peacock's leg is rubbed with water and this essenced water is used in ear infections	Ranthambhor, Baran, Darrah, Ramgarh
4. Dog	*Canis lupus familiaris (Linnaeus, 1758) Synonym- Canis familiaris*	Kukaro	Urine	26		13	8	Earache / ocular	Used as eardrop for curing earache.	Ranthambhor, Darrah, Ramgarh
5. Honey bee	*Apis cerana indica – (Fabricius 1798)*	Mokh	Honey	26	17	11	13	Eye disease / Ophthalmic	Used as eye drops to cure eye disease.	Ranthambhore, Baran, Darrah, Ramgarh
6. Sambhar	*Cervus unicolor (Kerr, 1792)*	Sambhar	Antler	3		6	3	Eye ailments / Ophthalmic	Antler is rubbed with water this paste is applied in eye ailments.	Ranthambhore, Darrah, Ramgarh
7. Human	*Homo sapiens (Linnaeus, 1758)*	Manakh	Milk	3				Eyeache/ Ophthalmic	Mother's milk is applied as eye drop to relieve eyeache in children.	Ranthambhore
Gastric problems										
8. House sparrow	*Passer domesticus (Linnaeus, 1758)*	Cheedi	Fecal	23		5	8	Constipation / anal	Fecal matter is applied in the anus of baby to treat constipation.	Ranthambhore, Darrah, Ramgarh

English Name	Scientific Name	Local Name	Part used	Informants reported				medicinal use/ mode of administration	Method of preparation	Related reported areas
				Ranthambhore N=(30	Baran N=(21)	Darrah N=(20)	Ramgarh N=(20)			
9. Indian ass	*Equus asinus (Linnaeus, 1758)*	Gadha	Dung	2				Jaundice / oral	Dung kept in water and after one day filtered water is given to cure jaundice.	Ranthambhore
Impotency, aphrodisiac										
10. Spiny – tailed lizard	*Uromastyx hardwickii (Gray, 1827)*	sanda	Whole body			8	5	Aphrodisiac / topical	The oil of this lizard is used for aphrodisiac.	Darrah, Ramgarh
11. Indian Peafowl	*Pavo cristatus (Linnaeus, 1758)*	Mor	Feather		4			Infertility / oral	Moon of Feather mix with Jaggary.	Baran
12. Collared dove	*Streptopelia decaocto (Frivaldszky, 1838)*	Kamedii	Flesh	6				To attain puberty / oral	To attain early puberty flesh of collared dove is eaten.	Ranthambhore
13. Laughing dove	*Streptopelia senegalensis*	Kamedii	Flesh	3				To attain puberty / oral	Flesh of laughing dove is also eaten To attain early puberty.	Ranthambhore
Miscellaneous										
14. Cow	*Bos taurus (Linnaeus, 1758) Synonym-Bos indicus*	Gai	Urine	2				Cancer / oral	Given to cure cancer.	Ranthambhore
15. Horse	*Equus caballus (Linnaeus, 1758)*	Ghoda	Semen		2			Tetanus, Rabies / oral	Administered orally to cure.	Baran
Nervous system problems										
16. Pigeon	*Columba livia (Gmelin, 1789)*	Kabutar	Fresh blood,	17	14	7	11	Paralysis / topical	The fresh blood is massaged externally to treat paralysis.	Ranthambhore, Baran, Darrah, Ramgarh
17. Pigeon	*Columba livia (Gmelin, 1789)*	Kabutar	Feather			9	7	Paralysis, / nasal	When Pigeons are flying, a warm air is produced by feather and whole body. This air is very useful to a patient.	Darrah, Ramgarh

English Name	Scientific Name	Local Name	Part used	Informants reported				medicinal use/ mode of administration	Method of preparation	Related reported areas
				Ranthambhore N=(30	Baran N=(21)	Darrah N=(20)	Ramgarh N=(20)			
Pains										
18. Spiny – tailed lizard	*Uromastyx hardwickii (Gray, 1827)*	sanda	Whole body	3		8	11	Back pain / topical	The oil of this lizard is used for back pain.	Ranthambhore, Darrah, Ramgarh
19. Cow	*Bos taurus (Linnaeus, 1758) Synonym- Bos indicus*	Gai	Dung + Milk	22		7		Muscle pain / topical	Muscle pain can relieve by smear of dung and milk mixture.	Ranthambhore, Darrah
20. Camel	*Camelus dromedarius (Linnaeus, 1758)*	Uant	Milk		15	12	12	Muscular pain/ topical	Used as massage cream in muscular pain.	Baran, Darrah, Ramgarh
21. Sheep	*Ovis aries (Linnaeus, 1758)*	Menda	Milk	26	16	14	12	Muscular pain/ topical	Used as massage cream in muscular pain.	Ranthambhore, Baran, Darrah, Ramgarh
22. Pig	*Sus scrofa domestica*	Soor	Fat	14				Muscular pain/ topical	Fat of pig is use as massage cream in muscular pain.	Ranthambhore
Respiratory system problems										
23. hen	*Gallus gallus domesticus*	murgi	egg	3		10	12	Cold, cough / oral	Put the egg in warm wooden ash and after an hour the cooked egg is eaten by patient	Ranthambhore, Darrah, Ramgarh
24. Hard shelled Turtle	*Kachuga tentoria (Gray, 1834)*	Kachhua	Carapace Flesh	10	5			cough, asthma, T. B. / oral	Ash of carapace is used in lung diseases as cough, asthma, T. B.	Ranthambhore, Baran
25. Indian Flap shell turtle	*Lissemys punctata (Lacépède, 1788)*	Kachhua	Carapace	2		7	5	Cough, asthma/ oral	Carapace is burnt and ash is used for healing to cough and asthma.	Ranthambhore, Darrah, Ramgarh
26. Bank myna	*Acridotheres ginginianus (Latham, 1790)*	Gurgul	Flesh	2				Cough, asthma/ oral	Flesh is eaten to treat cough and asthma.	Ranthambhore,
27. Crab	*Cancer pagurus (Linnaeus, 1758)*	Kekada	Whole body		6	4	4	Cough, asthma, T. B. / oral	Ash of crab is used in lung diseases as cough, asthma, T. B.	Baran, Darrah, Ramgarh

English Name	Scientific Name	Local Name	Part used	Informants reported				medicinal use/ mode of administration	Method of preparation	Related reported areas
				Ranthambhore N=(30	Baran N=(21)	Darrah N=(20)	Ramgarh N=(20)			
28. Goat	*Capra indicus*	Bakri	Urine	3	12			Cough, tuberculosis/ oral	Urine of goat administered orally to cure tuberculosis.	Ranthambhore, Baran
29. Indian Flying Fox	*Pteropus giganteus (Brünnich, 1782)*	Chankadad	Flesh	2				Asthma/ oral	Flesh is given to cure asthma.	Ranthambhore,
30. Indian Hare	*Lepus nigricollis (F. Cuvier, 1823)*	Khargosh	Flesh	2				Cough/ oral	Flesh of hare is given to cure cough.	Ranthambhore,
31. Prawn	*Macrobrachium malcolmsonii (H. Milne-Edwards, 1844)*	Jhinga machchi	Dried powder		2			Tuberculosis / oral	Eaten in Tuberculosis.	Baran
Skin related problems										
32. Honey bee	*Apis cerana indica (Fabricius 1798)*	Mokhi	Honey	3				Skin abrasion/ Topical	Applied externally	Ranthambhore,
33. Bivalves	*Mactra sp.*	Seepi	Shell	4			4	Acne/ topical	Shell of sepia is rubbed with clarified butter	Ranthambhore, Ramgarh
34. Frog	*Hoplobatrachus tigerinus* (Daudin, 1803)	*Mendki*	Urine			5		Acne at under arm/ topical	Small frog is tie on the acne at under arm, the frog delivered urine.	Darrah
35. Cobra	*Naja naja (Linnaeus, 1758*	Nag	Skin molting	3				Skin diseases/ topical	Skin molting crush with curd and applied on skin to treat microbial infections.	Ranthambhore
36. Pigeon	*Columba livia (Gmelin, 1789)*	Kabutar	excreta			4	5	Acne/ topical	Excreta mix with water and paste is applied on acne.	Darrah, Ramgarh
37. Sambhar	*Cervus unicolor (Kerr, 1792)*	Sambhar	Antler		3	6		Herpes/ topical	Antler is rubbed with water this paste is applied in Herpes.	Baran, Darrah
38. Human	*Homo sapiens (Linnaeus, 1758)*	Manakh	Bones		3		3	Herpes/ topical	Bones is rubbed with water this paste is applied in Herpes	Baran, Ramgarh

English Name	Scientific Name	Local Name	Part used	Informants reported				medicinal use/ mode of administration	Method of preparation	Related reported areas
				Ranthambhore N=(30	Baran N=(21)	Darrah N=(20)	Ramgarh N=(20)			
Urinary Problems										
39. Fish	*Labeo rohita (Hamilton, 1822)*	Machchhi	Cervical vertebrae		10		9	Urine Problem / oral	A fish cervical vertebra is rubbed with water and this essenced water is drunk in urine blockage problem.	Baran, Ramgarh
Weakness										
40. Cow	*Bos taurus (Linnaeus, 1758) Synonym-Bos indicus*	Gai	Urine	21		8	10	Weakness / oral	Weakness due to fever is cure by drinking urine.	Ranthambhore, Darrah, Ramgarh
41. Goat	*Capra indicus*	Bakri	Bones of Legs		21	8	14	Weakness / oral	Soup of leg's bone used to cure weakness.	Baran, Darrah, Ramgarh
42. Bivalves	*Mactra sp.*	Seepi	shell		11	5		Weakness / oral	Ash of shell is eaten to end weakness.	Baran, Darrah
43. Snail	*Pila globosa (Swainson, 1822)*	Sankh	shell		11	5		Weakness / oral	Ash of shell is eaten to end weakness.	Baran, Darrah
Wound healing										
44. Goat	*Capra indicus*	Bakri	Milk	27		11		Mouth ulcer / oral	Mouth ulcer is treated by direct	Ranthambhore, Darrah
45. Human	*Homo sapiens (Linnaeus, 1758)*	Manakh	Urine	30	19	12	17	Wound / topical	Human urine is used as antiseptic for wound healing.	Ranthambhore, Baran, Darrah, Ramgarh

Table 2- List of animals reported for medicinal purposes in the south east Rajasthan, India.

S. N.	Category	*Scientific name*	English name	Red data list	CITES
1.	Invertebrate	*Apis cerana indica – (Fabricius 1798)*	Honey bee		
2.	Invertebrate	*Cancer pagurus (Linnaeus, 1758)*	Crab		
3.	Invertebrate	*Macrobrachium malcolmsonii (H. Milne-Edwards, 1844)*	Prawn		
4.	Invertebrate	*Mactra sp.*	Bivalve		
5.	Invertebrate	*Pila globosa (Swainson, 1822)*	Snail		
6.	Pisces	*Labeo rohita (Hamilton, 1822)*	Fish	Least concern	
7.	Amphibian	*Hoplobatrachus tigerinus (Daudin, 1803)* *synonym-Rana tigrina*	Frog	Vulnerable	II
8.	Reptile	*Kachuga tentoria (Gray, 1834)*	Hard shelled turtle	Vulnerable	II

9.	Reptile	*Lissemys punctata (Lacépède, 1788)*	Indian Flap shell turtle	Near threatened	II
10.	Reptile	*Uromastyx hardwickii (Gray, 1827)*	Spiny tailed lizard	Vulnerable	II
11.	Reptile	*Naja naja (Linnaeus, 1758)*	Cobra	Near threatened	II
12.	Birds	*Acridotheres ginginianus (Latham, 1790)*	Bank myna	Least concern	
13.	Birds	*Columba livia (Gmelin, 1789)*	Pigeon	Least concern	III
14.	Birds	*Gallus gallus domesticus*	Hen	Least concern	
15.	Birds	*Passer domesticus (Linnaeus, 1758)*	House sparrow	Least concern	
16.	Birds	*Pavo cristatus (Linnaeus, 1758)*	Peacock	Least concern	
17.	Birds	*Streptopelia decaocto (Frivaldszky, 1838)*	Collared dove	Least concern	
18.	Birds	*Streptopelia senegalensis*	Laughing dove	Least concern	
19.	Mammal	*Bos taurus (Linnaeus, 1758) Synonym- Bos indicus*	Cow		
20.	Mammal	*Camelus dromedarius (Linnaeus, 1758)*	Camel	Least concern	
21.	Mammal	*Canis lupus familiaris (Linnaeus, 1758) Synonym- Canis familiaris*	Dog		
22.	Mammal	*Capra indicus*	Goat		
23.	Mammal	*Ovis aries (Linnaeus, 1758)*	Sheep		
24.	Mammal	*Cervus unicolor (Kerr, 1792)*	Sambhar	Least concern	
25.	Mammal	*Equus asinus (Linnaeus, 1758)*	Ass		
26.	Mammal	*Equus caballus (Linnaeus, 1758)*	Horse		
27.	Mammal	*Homo sapiens (Linnaeus, 1758)*	Human		
28.	Mammal	*Lepus nigricollis (F. Cuvier, 1823)*	Hare	Least concern	
29.	Mammal	*Pteropus giganteus (Brünnich, 1782)*	Indian flying fox	Near threatened	II
30.	Mammal	*Sus scrofa domestica*	Pig	Least concern	

The mammals are highest number to use for medicinal purposes. 12 (40%) mammals, 7 (23.3%) birds, 5 (16.7%) invertebrates, 4 (13.3%) reptiles, one (3.3%) amphibian and one (3.3%) fishes have medicinal properties (Table 3). Of the total 30 animal species reported 18 (60%) included in IUCN red data list (Table 4) and 7 (23%) are listed in CITES appendix I, II, and III.

The no. of animal species and their medicinal usage in each disease category are shown in table 5. The highest number of animal species (9, 30%) is used for the treatment of Respiratory problems like asthma, cough, cold, tuberculosis with 9 (20%) usage in this category. Skin related Problems are treated with 7 species (23.3%) for 7 (15.5%) usage. Rheumatic and other pains are treated with 5 species (16.7%) for 5 (11.1%) usage. 5 species (16.7%) are reported in 5 (11.1%) usage to treat in eye and ear problems. Impotency, aphrodisiac and birth control category is reported with 4 species (13.3%) for 4 (8.9%) usage. Gastric problems are reported with 2 species (6.7%) for 2 (4.4%) usage. 2 (6.7%) animal species are reported in 2 (4.4%) usage of miscellaneous disease category.

Table 3- No. of animal species in different group reported for medicinal purposes in South East Rajasthan, India.

Name of animal group	No. of species	% of Total animals
Mammals	12	40%
Birds	7	23.3%
Reptiles	4	13.3%
Amphibians	1	3.3%
Fishes	1	3.3%
Invertebrates	5	16.7%
Total	**30**	**100%**

Table 4- Conservation status of animal species reported for medicinal purposes in South East Rajasthan, India according to IUCN Red List or Red Data List.

Conservation status	**No. of animal species**	**% of total 30 animal species reported**
Endangered		
Vulnerable	3	10
Conservation Dependent		
Near threatened	3	10
Least concern	12	40
Data Deficient		
Not evaluated		
Total	**18**	**60%**

Table 5- No. of animal species and their medicinal usage in different disease categories as reported in south east Rajasthan, India.

Disease Category	**No. of animal Used (30)**	**% of total 30 animals used**	**No. of medicinal used of animals (45)**	**%**
Antidote	1	3.3	1	2.2
Burn	1	3.3	1	2.2
Eye and Ear	5	16.7	5	11.1
Gastric disorder	2	6.7	2	4.4
Gynecological problems	-	-	-	-
Impotency, aphrodisiac	4	13.3	4	8.9
Miscellaneous	2	6.7	2	4.4
Nervous System	1	3.3	2	4.4
Rheumatic and other pains	5	16.7	5	11.1
Respiratory Problem	9	30	9	20
Skin related Problem	7	23.3	7	15.5
Urinary Problem	1	3.3	1	2.2
Weakness	4	13.3	4	8.9
Wound healing	2	6.7	2	4.4

Table 6- Animal parts or products reported for medicinal purposes in south east Rajasthan,

Medicinal use without injury to animal	Medicinal use with/without injury to animal		Medicinal use with injury to animals						
By-products (Honey, milk, mucous, wax, cocoon, molting, musk, egg)	Excreta	Urine	scale/ antler/ Feather/ shell/ semen	Bones / carapace	Flesh/ meat	Fat	Blood	Org ans/ bile	Whole body/ ash/ powder
9	4	6	8	6	5	1	1	1	4
20%	9%	13%	18%	13%	11%	2%	2%	2%	9%

In 19 medicinal preparations, raw materials are collected without injury to animal (byproducts usage in 9 preparations, excreta usage in 4 preparations and urine usage in 6 preparations). In 14 medicinal preparations, raw materials are collected with or without injury to animal life (scale, antler, feather, teeth are usage in 8 preparation and bones are used in 6 preparations). Raw materials are used in 12 medicinal preparations is always injured to animal life (flesh in 5 preparations, fat, blood, organ are each in 1 preparations, whole body and ash in 4 preparations) (Table 7).

All animal body part or products usage as raw materials are categorized in following three categories (Table 8). (1) Excreta, urine, by-products (Honey, milk, mucous, wax, shellac, cocoon, musk, egg, molting, ghee) are those raw materials, which are collected without injury to animal's life. (2) But flesh, fat, organs, bile, blood, whole body and ash are those raw materials, which are always collected with injury to animal life. (3) However some raw material like scale, antler, feather, teeth, shell and bones can be collected with injury to animal life or some time these raw materials can be collected from natural dead animals.

Six type of mode of administrations are reported in this study i. e. oral, topical, ophthalmic, ocular, anal and nasal (table 8). Oral administration is reported in 22 medicinal preparations with highest priority. Topical administration is reported in 16 preparations. Ophthalmic administration is reported in 2 preparations. Nasal and anal administration is reported in single use in each category in this study.

Table 7- Raw material collected with or without injury to animal life for medicinal usage in south east Rajasthan, India.

Raw material	**No. of medicinal usage**	**% of animal usage**
With injury to animal life	12	26.7%
With or without injury to animal life	14	31.1%
without injury to animal life	19	42.2%
Total	**45**	

Table 8- Mode of administration of animal products in medicinal usage in south east Rajasthan, India.

Mode of administration	No. of usage
Oral	22
Topical	16
Ophthalmic	3
Ocular	2
Nasal	1
Anal	1

DISCUSSION

Approximately 109 animals and their 270 medicinal uses are reported in traditional medicine in different parts of India (Mahawar, 2008). In the present study in south east Rajasthan 30 animal species are reported for 45 medicinal usages by ethnic communities. The mammals are highest number to use for medicinal purposes. Of the total 30 animal species reported 18 (60%) included in IUCN red data list and 7 (23%) are listed in CITES appendix I, II, and III. Ranthambhore national park is our first study area, where 23 animals are reported for 29 therapeutic purposes by the Informants (Mahawar and Jaroli, 2006). The Saharias reported a total of 15 animal species for 19 different ethnomedical purposes, including cough, asthma, tuberculosis, paralysis, earache, weakness, muscular pain etc (Mahawar and Jaroli, 2007). 18 animal species are reported for 24 therapeutic purposes by the informants of the Darrah sanctuary. The informants of Ramgarh sanctuary area reported 17 animal species for 21 medicinal purposes. Many other studies also reported medicinal uses of animals in rajasthan (Sharma, 2002; Vyas et al 2009; Jaroli et al, 2010).

The number of animals reported for medicinal purposes in different parts of India is enough to feel a need to discuss on the use of animals and their products, as medicines. In order to stress how important animals were, are and can be as sources of pharmacological substances and discussion on the use of the animals and their products, as medicines in conservation biology and sustainable use. All these traditional knowledge can give clue to identify biologically active constituent in these species. However, further biochemical and pharmacological studies are needed to promote the development of new drugs for the improvement of human health [Costa Neto, 2005].

Traditional medicines in general represent still a poorly explored field of research in terms of therapeutic potential or clinical evaluation. It is essential, however, that traditional drug therapies be submitted to an appropriate benefit/risk analysis [De Smet, 1991].

The worldwide market for animal parts and their medicinal derivatives is contributing to loss of some animal species. In this context, research opportunities should focus both on the documentation of the traditional uses of animal and plants in traditional medicine and the cultural and ecological aspects associated with such practices [Alves and Rosa, 2005].

Another aspect of this study, which needs to be mentioned, is that the findings regarding the use of animals for medicines are purely based on the traditional beliefs and practices of local communities. Thus, there is a need to identify any myths associated use by scientific laboratory test, if the remedial measures, for which these animals are used, are not proved scientifically, the common man should be made aware of this by special education programs and this will be significantly help in the conservation of biodiversity.

Reference

1. Alexiades, M. N. (1996): Selected guidelines for ethnobotanical research: A field manual. *In Advances in Economic Botany* **(10).** Bronx: The New York Botanical Garden.Alves, R. R. N. and Rosa, I. L. (2005): Why study the use of animal products in traditional medicines? *Journal of Ethnobiology and Ethnomedicine*, **1(5)**. [http://dx.doi.org/10.1186/1746-4269-1-5]

2. China National Corporation of Traditional and Herbal Medicine (1995): *Materia Medica Commonly Used in China*. Beijing: Science Press.

3. Costa Neto, E. M. (2005): Animal-based medicines: biological prospection and the sustainable use of zootherapeutic resources. *Anais da Academia Brasileira de Ciências*, **77(1)**:33-43. [http://www.scielo.br/ pdf/aabc/v77n1/a04v77n1.pdf]

4. De Smet, P. A. G. M. (1991): Is there any danger in using traditional remedies? *J. Ethnopharmacology*, **32**:43-50. [http://dx.doi.org/ 10.1016/0378-8741(91)90102-J]

5. ITIS (2012) : Catalogue of Life: Annual Checklist. (http://www.catalogueo Xife. org/search.php)

6. IUCN (2012)—the World Conservation Union IUCN red list of threatened species. (http://www.iucnredlist.org)

7. Jaroli DP, Mahawar M M and Vyas N (2010): An ethnozoological study in the adjoining areasof Mount Abu wildlife sanctuary, India. Journal of Ethnobiology and Ethnomedicine 2010, 6:6 [*http://www.ethnobiomed.com/content/6/1/6*]

8. Mahawar, M. M. and Jaroli, D. P. (2006): Animals and their products utilized as medicines by the inhabitants surrounding the Ranthambhore National Park, India. *J. Ethnobiology and ethnomedicine*, **2 (46)**. [http://www.ethnobiomed.com/content/2/1/46]

9. Mahawar, M. M. and Jaroli, D. P. (2007): Traditional knowledge on zootherapeutic uses by the Saharia tribe of Rajasthan, India. *J. Ethnobiology and ethnomedicine*, **3 (25)**. [http://www.ethnobiomed. com/content/3/1/25]

10. Mahawar, M. M. and Jaroli, D. P. (2008): Traditional zootherapeutic studies in India: a review. *J. Ethnobiology and ethnomedicine*, **4 (17)**. [http://www.ethnobiomed. com/content/4/1/17]

11. Marques, J. G. W. (1997): Fauna medicinal: Recurso do ambiente ou ameaça à biodiversidade? *Mutum*, **1(1)**:4.

12. Pandey, V. N. (1996): The Product of Animal Origin as Recipes in Ayurvedic Mediments. *In Ethnobiology in Human Welfare*, Ed by Jain S K. New Delhi: Deep Publication; 203-205.

13. Sharma, M, P. (1996): Drugs of animal origin in Unani medicine: The need for scientific evaluation. *In Ethnobiology in Human Welfare*, edited by Jain S K, New Delhi: Deep Publications; 206.

14. Sharma, S. K. (2002): A study on ethnozoology of Southern Rajasthan. *In* Ethnobotany. Edited by Trivedi P C, Jaipur: Aavishkar Publisher; 239-253

15. Unnikrishnan, P. M. (1998): Animals in Ayurveda. *Amruth*, (Suppl **1**): 1-15.

16. Vyas N, Mahawar M.M. and Jaroli D.P. (2009): Traditional Medicines Derived from Domestic Animals Used by Rebari Community of Rajasthan, India. Our Nature 7: 129-138

17. WHO/IUCN/WWF: *Guidelines on Conservation of Medicinal Plants.Switzerland* 1993 [http://www.wwf.org.uk/filelibrary/pdf /guidesonmedplants.pdf].