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Chemical composition, ethnopharmacological applications of animal biles-Mini review

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SUMMARY

Bile of animals are used in diverse illnesses. Bear bile is bitter in flavor and cool in character. It enters the meridian of the liver, gallbladder, and heart, relieving toxicity, clearing heat, stopping endogenous wind, and clearing away hepatic problems. The animal bile consists of the following salts i.e., Biliflavin, bilirubin diglucuronide, Bilirubin monoglucuronide, bilirubin diglucuronide, unconjugated bilirubin, phycobilin, Biliverdin, monoglucuronide, phycobilin, and unconjugated bilirubin. Published data show that the bile of animal species is used in traditional medicine. Bear, cinereous vulture, Indian flap-shelled turtle, rohu, cobra, common warthog, porcupine, spotted hyena, gazelle, olive baboon, elephant, common fox, snow leopard, ray's bream, Nile tilapia, house crow, cow, and flat-headed rock agama is used to treat goiter, swelling of throat and tongue, strangulation, gastric, tonsil, AIDS, diabetes, wounds, pulmonary problems, stomach, erythroblastosis, syphilis, kidney failure, internal problem, eye diseases, sharpen sight, respiratory disorders, aphrodisiac, arthritis, vision, and dysentery.

Keywords: Bile, Bear, Bilirubin, AIDS, Arthritis.

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INTRODUCTION

The use of biles (animal) for the healing of a wide range of *Homo sapiens* illnesses has 3 millennium histories across the world. The lineage of data on ethnopharmacological use attests to considerable documentation (Altaf *et al.*, 2018; Haq *et al.*, 2020). Furthermore, it is called "valuable pigment gallstone", a solid substance discovered usually in the gallbladders, was widely used in ethnopharmacology for a variety of medical purposes (Wang and Carey, 2014).

Animal wastes such as "hair keratin", "eggshell", "feather", and so on were also employed in nano synthesis (Gao *et al.*, 2019). However, there is relatively little research on animal-derived fluid wastes such as bile fluids, blood, and so on that include steroidal amphipathic molecules such as -COOH and -NH groups from bilirubin, cholesterol, fatty acids, phospholipids, proteins and so on (Rahmah, 2021). Furthermore, these materials may play an important role in decreasing metals and, as

a result, stabilizing nanoparticles (Jang *et al.*, 2019). In slaughterhouses, animal waste products such as bile are considered full trash. However, the use of bile in the realm of medicine is not new (Hinsley *et al.*, 2021). It was stated that dried bile from black bears was used to cure jaundice (Beuers *et al.*, 2015).

Bear bile is an old remedy method that is "bitter" in taste and cold in character. It enters the meridian of the liver, gallbladder, and heart, relieving toxicity, clearing heat, stopping endogenous wind and clearing away hepatic problems (Chen *et al.*, 2012; Feng and Jia, 2015). Modern pharmacological investigations have also recommended that "bear bile" has a variety of "pharmacological properties", including "antiviral", "antibacterial", "anti-inflammation", "hypolipidemic", "anti-gallstones" and "hepatoprotection" (Fu and Fan, 2014; Zhao *et al.*, 2015).

COMPOSITION OF BILE

The animal biles consist of following salts i.e. "Bili-flavin", "bilirubin diglucuronide", "bilirubin monoglucuronide:, "bilirubin diglucuronide", "unconjugated bilirubin", "phycobilin", "biliverdin", "monoglucuronide", "phycobilin" and "unconjugated bilirubin" (Table 1).

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Table 1: The composition of Bile in different animals.

Sr.	Names	Bile pigments	References
1.	Bear *Ursus arctos*	Bilirubin, biliflavin, bilifulvin	(Zhang, 1987)
2.	Dog *Canis familiaris*	Bilirubin diglucuronide, bilirubin diglucuronidec, bilirubin monoxyloside	(Cornelius, 1986) (Fevery *et al.*, 1977)
3.	Black *carp Mylopharyngodon piceus*	Bilirubin monoglucuronide, bilirubin monoglucuronidec, bilirubin diglucuronide, unconjugated bilirubin, Biliverdin	(Berk and Berlin, 1977; Fevery *et al.*, 1977)
4.	Common carp *Cyprinus carpio*	Biliverdin, bilirubin monoglucuronide, phycobilin, unconjugated bilirubin	(Garner, 1955; Low and Bada, 1974)
5.	Goat *Capra hircus*	Bilirubin monoglucuronide	(Fevery *et al.*, 1977; Cornelius, 1986)
6.	Shark *Mustelus manazo*	Biliverdin, bilirubin monoglucuronide, phycobilin, Unconjugated bilirubin	(Low and Bada, 1974; Cornelius, 1986)
7.	Pallas pit viper *Agkistrodon halys*	Biliverdin, bilirubin monoglucuronide, unconjugated bilirubin	(Noonan *et al.*, 1979)
8.	Grass carp *Ctenopharyngodon idellus*	Biliverdin, bilirubin monoglucuronide, phycobilin, Unconjugated bilirubin	(Low and Bada, 1974; Cornelius, 1986)
9.	Goose *Anser domestica*	Biliverdin, bilirubin monoglucuronide, bilirubin monoglucuronidec, Unconjugated bilirubin	(Cornelius, 1986)
10.	Duck *Anas domestica*	Biliverdin, bilirubin diglucuronide, bilirubin diglucuronidec	(Israels *et al.*, 1966)

11.	Crucian carp *Carassius auratus*	Biliverdin, bilirubin monoglucuronide, phycobilin, unconjugated bilirubin	(Low and Bada, 1974; Berk and Berlin, 1977; Cornelius, 1986)
12.	Turtle *Amyda sinensis*	Biliverdin, bilirubin monoglucuronide, unconjugated bilirubin	(Noonan *et al.*, 1979; Cornelius, 1986)
13.	Mandarin fish *Siniperca chuatsi*	Biliverdin, bilirubin monoglucuronide, phycobilin, unconjugated bilirubin	(Low and Bada, 1974; Berk and Berlin, 1977; Cornelius, 1986)
14.	Chinese forest frog *Rana limnocharis*	Biliverdin, unconjugated bilirubin	(Berk and Berlin, 1977; Cole and Little, 1983; Cornelius, 1986)
15.	Black snake *Zaocys dhumnades*	Biliverdin, bilirubin monoglucuronide, unconjugated bilirubin	(Noonan *et al.*, 1979)
16.	Yak *Bos grunniens*	Bilirubin monoglucuronide, bilirubin monoglucuronidec, bilirubin diglucuronide, unconjugated bilirubin, Biliverdin	(Garner, 1955; Berk and Berlin, 1977; Fevery *et al.*, 1977)
17.	Gaur *Bos gaurus*	Bilirubin monoglucuronide, bilirubin monoglucuronidec, bilirubin diglucuronide, unconjugated bilirubin, Biliverdin	[167,169,170 (Garner, 1955; Berk and Berlin, 1977; Fevery *et al.*, 1977)
18.	Horse *Equus caballus*	Bilirubin diglucuronide, bilirubin diglucuronidec, bilirubin monoglucuronide, bilirubin monoglucuronidec	(Cornelius *et al.*, 1975)
19.	Parrot *Psittacula alexandri fasciata*	Biliverdin	(Cornelius, 1986)
20.	Toad *Bufo* spp.	Biliverdin	[168,170,178,179 (Berk and Berlin, 1977; Cornelius, 1986)

TRADITIONAL USES OF BILE

Published data show that bile of different animal species is used in traditional medicine. Bear (*Ursus* sp.) is used to treat wounds (Yeshi *et al.*, 2017), pulmonary problems (Haq *et al.*, 2020). Cinereous vulture (*Aegypius monachus*) is used to treat Goiter (Yeshi *et al.*, 2017). Toad (*Bufo* spp.) is used to treat swelling of throat and tongue (Yeshi *et al.*, 2017). Indian flap-shelled turtle (*Lissemys punctata*) is used to treat strangulation (Altaf *et al.*, 2018). Rohu (*Labeo rohita*) is used to treat gastric (Borah and Prasad, 2017). Cobra (*Ophiophagus hannah*) is used to treat tonsil (Borah and Prasad, 2017). Common warthog (*Phacochoerus africanus*) is used to treat AIDS (Kendie *et al.*, 2018). Porcupine (*Hystrix* spp.) is used to treat diabetes, stomach

scramble (Kendie *et al.*, 2018). Spotted hyena (*Crocuta crocuta*) is used to treat erythroblastosis (Kendie *et al.*, 2018). Gazelle (*Gazella* spp.) is used to treat syphilis (Kendie *et al.*, 2018). Olive baboon (*Papio anubis*) is used to treat AIDS (Kendie *et al.*, 2018). Elephant (*Elephas maximus*) is used to treat kidney failure (Kendie *et al.*, 2018). Common fox (*Canis* spp.) is used to treat internal problem (Kendie *et al.*, 2018). Ray's bream (*Brama brama*) is used to treat eye diseases (Vallejo and González, 2014). Nile tilapia (*Oreochromis niloticusniloticus*) is used to treat sharpen sight (Vallejo and González, 2014). Snow leopard (*Panthera uncia*) is used to treat respiratory disorders (Haq *et al.*, 2020). House crow (*Corvus splendens*) is used to treat aphrodisiac (Vijayakumar *et al.*, 2015). Cow (*Bos primigenius taurus*) is used to treat arthritis (Vijayakumar *et al.*, 2015), vision (Chellappandian *et al.*, 2014). Flat-headed rock agama (*Agama wanzae*) is used to treat dysentery (Vats and Thomas, 2015) (Table 2).

Table 2: Ethnomedicinal applications of bile.

Species name	Reported ailments (References)
Bear (*Ursus* sp.)	Pulmonary problems (Haq *et al.*, 2020), wounds (Yeshi *et al.*, 2017)
Cinereous vulture (*Aegypiusmonachus*)	Goiter (Yeshi *et al.*, 2017)
Toad (*Bufo* sp.)	Swelling of throat and tongue (Yeshi *et al.*, 2017)
Indian Flap-shelled Turtle (*Lissemys punctata*)	Strangulation (Altaf *et al.*, 2018)
Rohu (*Labeo rohita*)	Gastric (Borah and Prasad, 2017)
Cobra (*Ophiophagus hannah*)	Tonsil (Borah and Prasad, 2017)
Common warthog (*Phacochoerus africanus*)	AIDS (Kendie *et al.*, 2018)
Porcupine (*Hystrix* spp.)	Diabetes, stomach scramble (Kendie *et al.*, 2018)
Spotted hyna (*Crocuta crocuta*)	Erythroblastosis (Kendie *et al.*, 2018)
Gazelle (*Gazella* spp.)	Syphilis (Kendie *et al.*, 2018)
Olive baboon (*Papio anubis*)	AIDS (Kendie *et al.*, 2018)
Elephant (*Elephas maximus*)	Kidney failure (Kendie *et al.*, 2018)
Common fox (*Canis* spp.)	Internal problem (Kendie *et al.*, 2018)
Ray's bream (*Brama brama*)	Eye diseases (Vallejo and González, 2014)
Nile tilapia (*Oreochromis niloticusniloticus*)	Sharpen sight (Vallejo and González, 2014)
Snow leopard (*Panthera uncia*)	Respiratory disorders (Haq *et al.*, 2020)
House crow (Corvus splendens)	Aphrodisiac (Vijayakumar *et al.*, 2015)
Cow (*Bos primigenius taurus*)	Arthritis (Vijayakumar *et al.*, 2015), vision (Chellappandian *et al.*, 2014)
Flat-headed Rock Agama (*Agama wanzae*)	Dysentery (Vats and Thomas, 2015)

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