Medicinal Properties and Toxic Effects of the Seeds of Abrus precatorius, Datura metel, Physostigma venenosum and Ricinus communis used in Ethnomedicine in Nigeria: A Review

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ABSTRACT: Plants with medicinal properties are used all over the world for disease treatment. Poisonous phytochemicals (toxins) in some or all parts of these medicinal plants are the cause of the toxic effects exerted by some medicinal plants. The objective of this paper is to provide a review on the medicinal effects and toxic properties of the seeds of some medicinal plants (Abrus precatorius, Datura metel, Physostigma venenosum and Ricinus communis) used in ethnomedicine in Nigeria by harvesting secondary data from standard online sources. This review gives collective reports on the medicinal properties of Abrus precatorius, Datura metel, Physostigma venenosum and Ricinus communis. The uses of the toxins isolated from the seeds of these plants in medicine are also reported in this review. Significant amount of information has been provided.

DOI: https://dx.doi.org/10.4314/jasem.v28i7.31

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Dates: Received: 21 May 2024; Revised: 17 June 2024; Accepted: 23 June 2024 Published: 02 July 2024

Keywords: Abrus precatorius; Datura metel; Physostigma venenosum; Ricinus communis; medicinal plants

Globally, plants that have medicinal effects have been utilized in ethnomedicine from pre-historic era for prevention and treatment of diseases. In developing countries, medicinal plants are used between 65% and 80% of the populations (WHO, 2011). Medicinal plants exert therapeutic effects on humans and animals. They are used for the treatment of diseases which includes stomach ache, fever, head ache, hypertension, malaria, diabetes, pile, body pain and cough (Rakotoarivelo et al., 2015; Namdeo, 2018; Abubakar et al., 2022). Medicinal plants are also used for preventing diseases including cancer (Paul et al., 2011), hypertension (Ghasi et al., 2011), hyperlipidaemia, atherosclerosis and hyperglycaemia (Özouguw and Eyo, 2011). All or some medicinal plants parts (leaves, seeds, roots, fruits, stem and flowers) are used as crude extracts or pure isolates (bioactive compounds isolated from medicinal plants) for disease treatment (Dawurung et al., 2021, Quenon et al., 2022; Saboon et al., 2019). There are reports from previous studies that medicinal plants exert therapeutic effect due to the presence of phytochemicals (Lee and Bae, 2017; Lee and Kim, 2016; Nyamai et al., 2016). Plants produce phytochemicals for self-protection but recent research shows that some phytochemicals can also be used for disease prevention/treatment and some may have toxic effect depending on the dose used for disease treatment or if they are toxins (Gadadhar and Karande, 2013; Kohnen-Johannsen and Kayser, 2019). Phytochemicals are plant bioactive chemical compounds that have beneficial health effects due to their great anti-oxidant potentials (Xinyi et al., 2022; Thakur et al., 2020). However, some phytochemicals are known to be highly toxic and such phytochemicals are called toxins. There are toxins that have health
benefits in small doses but poisonous in large concentrations. Plant phytochemicals includes alkaloids, saponins, phenols and flavonoids (Agideus, 2022). Toxic effects which include stomach ache, fever, nausea and mortality may occur after intake of medicinal plants due to the dose taken and the presence of toxins in the plant part(s) (Worbs et al., 2011; Batiha et al., 2020). These have raised concerns on the safety (possible toxic effect) of medicinal plants due to its use in ethnomedicine. Thus, toxicity studies are carried out on medicinal plants in so as to determine if the plants are safe for use as medicines and also to determine the median lethal dose (LD50) or lethal concentration in 50% of the population (LC50). There are reports from previous studies on the LD50 and LC50 of some medicinal plants (Okereke et al., 2021; Sunday et al., 2013a; Muhammad et al., 2015; Manal et al., 2018). Also there are reports from previous studies on toxins with therapeutic effect isolated from some medicinal plants (Lopez et al., 2017; Bhutia and Maiti, 2011; Scheindlin, 2010).

_Abrus precatorius, Datura metel, Physostigma venenosum and Ricinus communis_ are some of the plants with medicinal properties used in ethnomedicine in Nigeria for the treatment of numerous diseases including head ache, hypertension, diabetes, bronchitis, asthma, fever and inflammations. There are reports from literature that research works were carried out on medicinal plants in so as to determine if the plants are safe for use as medicines and also to determine the median lethal dose (LD50) or lethal concentration in 50% of the population (LC50). These have raised concerns on the safety (possible toxic effect) of medicinal plants due to its use in ethnomedicine. Thus, toxicity studies are carried out on medicinal plants in so as to determine if the plants are safe for use as medicines and also to determine the median lethal dose (LD50) or lethal concentration in 50% of the population (LC50). There are reports from previous studies on the LD50 and LC50 of some medicinal plants (Okereke et al., 2021; Sunday et al., 2013a; Muhammad et al., 2015; Manal et al., 2018). Also there are reports from previous studies on toxins with therapeutic effect isolated from some medicinal plants (Lopez et al., 2017; Bhutia and Maiti, 2011; Scheindlin, 2010).

Previous studies carried out on the seeds of these plants reported that, they are extremely toxic because of the high concentration of poisonous phytochemicals (toxins) in the seeds. Activity guided pharmacological studies carried out on the toxins isolated from the seeds of these plants reported that the toxins have therapeutic effect depending on the dose administered. Therefore, the objective of this paper is to provide a review on the medicinal properties and toxic effects of the seeds of some medicinal plants (_Abrus precatorius, Datura metel, Physostigma venenosum and Ricinus communis_) used in ethnomedicine in Nigeria.

**Materials and Methods**

Articles that were published previously was searched using SCOPUS, Medline, Google Scholar, PubMed, Research Gate and Web of Science databases to extract the information about some toxic plants in Nigeria with therapeutic effect. The terms used for the search were “medicinal plants in Nigeria,” “toxic plants with therapeutic effect,” “parts of plants with medicinal property,” “parts of plants with toxic effect” and “symptoms of some medicinal plants toxicity”. Articles published online from year 2000 till date was included in this study.

**Results and Discussion**

Medicinal plants with toxic properties: The plants _Abrus precatorius, Datura metel, Physostigma venenosum and Ricinus communis_ are used in traditional medicine (ethnomedicine) for the treatment of numerous diseases (Table 1).

<table>
<thead>
<tr>
<th>Botanical name</th>
<th>Family</th>
<th>Common names in other parts of the world</th>
<th>Local names in Nigeria</th>
<th>Part used in ethnomedicine</th>
<th>Uses in ethnomedicine</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Abrus precatorius</em></td>
<td>Fabaceae</td>
<td>Rosary pea and Crab's eye</td>
<td>Idonzakara in Hausa; Anya mumu in Igbo; and Oju-oelogbo in Yoruba.</td>
<td>Leaves and seeds</td>
<td>Treatment of jaundice, hepatitis, abdominal pain, cough, diarrhea and gonorrhea.</td>
<td>Sunday et al., 2013a; Sunday et al., 2013b; Taur and Patil, 2011; Acharya, 2004.</td>
</tr>
<tr>
<td><em>Datura metel</em></td>
<td>Solanaceae</td>
<td>Angel's trumpet and Devil's apple</td>
<td>Zakami in Hausa; Myarammu in Igbo; and Apikan in Yoruba.</td>
<td>The whole plant</td>
<td>Treatment of convulsion, tetanus, glaucoma; hypertension, constipation and epilepsy.</td>
<td>Nargish, 2022; Khaton and Shaik, 2012; Jandhade et al., 2010; Yusuf et al., 2009; Agra et al., 2007.</td>
</tr>
<tr>
<td><em>Physostigma venenosum</em></td>
<td>Fabaceae</td>
<td>Calabar bean, Oreal bean and Chop nut</td>
<td>Calabar bean</td>
<td>Seeds</td>
<td>Treatment of diabetes, ulcer, eye infection; convulsion, fever, asthma.</td>
<td>Ahikokah and Erhabor, 2019; Scheindlin, 2010; Wickersham and Novak 2003.</td>
</tr>
<tr>
<td><em>Ricinus communis</em></td>
<td>Euphorbiaceae</td>
<td>Caster Plant and Palm of Christ</td>
<td>Zurman in Hausa; Ogili isi in Igbo; and Ilara in Yoruba</td>
<td>Leaves, roots and seeds</td>
<td>Treatment of diabetes, ulcer, eye infection; convulsion, fever, asthma.</td>
<td>Sandford et al., 2021; Ramanjaneyula et al., 2017; Latta 2014; Roxas-Duncan and Smith 2012; Rachhadya et al., 2011; Dyaneshwar, 2011; Tripathi et al., 2010; Shokeen et al., 2008.</td>
</tr>
</tbody>
</table>
Table 2. Toxic properties of the seeds of Abrus precatorius, Datura metel, Physostigma venenosum and Ricinus communis used in ethnomedicine in Nigeria.

<table>
<thead>
<tr>
<th>Botanical name</th>
<th>Symptoms of toxicity</th>
<th>Toxin present in the seeds</th>
<th>Type of toxin</th>
<th>Medicinal uses of the toxin</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrus precatorius</td>
<td>Severe abdominal pain, burning in the throat, nausea and vomiting.</td>
<td>Abrin</td>
<td>Toxalbumin</td>
<td>Treatment for killing cancer cells.</td>
<td>Sunday et al., 2013a; Bhutia and Maiti, 2011; Anam, 2001; Parrotta 2001</td>
</tr>
<tr>
<td>Datura metel</td>
<td>Constipation, ataxia, seizures and changes in heart rate.</td>
<td>Tropane</td>
<td>Alkaloid</td>
<td>It is used for sedation, treatment of muscle spasms and eye problems.</td>
<td>Kohnen-Johannsen and Kayser, 2019; Krenzelok, 2010; Nuhu, 2002</td>
</tr>
<tr>
<td>Physostigma venenosum</td>
<td>Weakness of the muscles, cardiac arrest and rapid contraction of the heart muscles.</td>
<td>Physostigmine</td>
<td>Alkaloid</td>
<td>It is used for preventing damage to the optic nerve and countering toxicity in the central nervous system caused by anti-cholinergic medications</td>
<td>Battha et al., 2020; Arens and Kearney, 2019; Wickersham and Novak, 2003</td>
</tr>
<tr>
<td>Ricinus communis</td>
<td>Kidney failure, muscular pains, dyspnoea, liver failure, edema.</td>
<td>Ricin and Ricinine</td>
<td>Ricin is a toxalbumin.</td>
<td>Ricin is reported to have Lipolytic activity.</td>
<td>Heike et al., 2019; Waseem et al., 2018; Lopez Nunez et al., 2017; Bhaskaran et al., 2014; Friedman and Rasooly, 2013; Darby et al., 2001; Lombard et al., 2001</td>
</tr>
</tbody>
</table>

Symptoms of toxicity, toxins and the medicinal uses of the toxins present in the seeds of A. precatorius, D. metel, P. venenosum and R. communis have been reported in previous studies carried out on the plants (Table 2). Also, toxicity studies carried out on the seeds of A. precatorius, D. metel, P. venenosum and R. communis have been reported (Table 3). Abrus precatorius: The plant Abrus precatorius is a herbaceous flowering plant that belongs to the family of Fabaceae.

The plant is found in tropical climates which includes West Africa, South China and India. The seeds of A. precatorius are commonly known as Crab’s eye and Jequirity pea, Rosary pea (Huiqin et al., 2022; Bhutia and Maiti, 2011) and Ojuologbo in south-western Nigeria (Table 1). Abrus precatorius is an annual plant that is slender and it has a high climbing vine. The leaves of A. precatorius are glabrous (hairless) with long internodes. The matured seed of A. precatorius is brilliant red with a hard, glossy and smooth seed coat (Bhutia and Maiti, 2011).

Toxicity of Abrus precatorius: A. precatorius is a plant that produces seeds that are beautiful and highly toxic (Bhutia and Maiti, 2011; Anam, 2001; Fernando, 2001). Abrin a toxalbumin is the toxin present in A. precatorius plant (Gadadhar and Karande 2013; Parrotta 2001). Abrin, a ribosome - inactivating protein inhibits protein synthesis there by leading to cell death (Gadadhar and Karande 2013; Bhutia and Maiti, 2011; Narayanan and Surendranath, 2005). Abrin toxicity symptoms include blood in stool, acute renal damage, seizures, tremor, vomiting, abdominal pain and nausea (Karthikeyan and Amalnath, 2017; Patil et al., 2016; Ganesan and Ettiyan 2015; Khanna et al., 2014). Overdose or usage of Abrus precatorius seeds for a long period may result in toxicity due to the toxin Abrin present in the seeds (Table 2).

Medicinal uses of Abrus precatorius: A. precatorius is used in ethnomedicine for treating diseases which include diarrhea, skin infections, abdominal pain, sexually transmissible infections, dysentery, gonorrhea and malaria (Taur and Patil, 2011) (Table 1). There are reports from previous studies that Abrus precatorius have antitumor, antioxidant, antimicrobial, anti-inflammatory, anti-asthmatic, antidiabetic and antifertility properties (Huiqin et al., 2022; Chopra et al., 2020; Taur and Patil, 2011).

The seeds are used for treating cough, inflammations, gonorrhea, jaundice, malaria and eye problems (Huiqinet et al., 2022; Acharya, 2004). The toxin Abrin has been reported to have the potential to kill cancer cells (Bhutia and Maiti, 2011) (Table 2).
Table 3. Toxicity studies carried out on the seeds of A. precatorius, D. metel, P. venenosum and R. communis.

<table>
<thead>
<tr>
<th>Botanical name</th>
<th>Seed extract</th>
<th>Toxicity studies and route of administration</th>
<th>Experimental animal used</th>
<th>Acute toxicity studies (Median Lethal dose and Median Lethal Concentration [LD50])</th>
<th>Sub-chronic and sub-acute toxicity studies</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrus precatorius</td>
<td>Methanolic extract</td>
<td>Cytoxicity test. Acute toxicity test via oral route (p.o.).</td>
<td>Brine shrimps.</td>
<td>LD50 = 169.36 μg/ml in Brine shrimps.</td>
<td>14 days sub-acute toxicity studies in Wistar rats reported that degenerative changes were observed in the histology of the liver, lungs, intestines and kidney. Also the seed extract may possess moderate toxicity.</td>
<td>Maregesi et al., 2016.</td>
</tr>
<tr>
<td></td>
<td>Aqueous extract</td>
<td>Acute toxicity test via oral route and interperito-neal (i.p.) route.</td>
<td>Albino Mice.</td>
<td>LD50 is greater than 5000 mg/kg (via oral route) and 0.71 mg/kg (i.p.) in Albino mice.</td>
<td>28 days toxicity studies concluded that he plant extract may affect the red blood cells and it might have a negative effect on the kidney and liver.</td>
<td>Sunday, 2022; Sunday et al., 2013a; Sunday et al., 2013b.</td>
</tr>
<tr>
<td>Datura metel</td>
<td>Aqueous extract</td>
<td>Acute and sub-chronic toxicity studies via oral route.</td>
<td>Albino rats.</td>
<td>LD50 = 5000 mg/kg.</td>
<td>14 days toxicity concluded that the extracts may cause liver toxicity and it may induce inflammatory cellular infiltration within some regions in the liver.</td>
<td>Okerere et al., 2021.</td>
</tr>
<tr>
<td></td>
<td>Aqueous and methanolic extract</td>
<td>Sub-chronic toxicity studies via oral route.</td>
<td>Wistar rats</td>
<td>LD50 &gt; 5000 mg/kg in Albino Mice. Histological examination showed nephrotoxicity and hepatotoxicity.</td>
<td>14 days toxicity concluded that the extracts may cause liver toxicity and it may induce inflammatory cellular infiltration within some regions in the liver.</td>
<td>Ibewebeat, 2023.</td>
</tr>
<tr>
<td>Physostigma venenosum</td>
<td>Ethanolic extract</td>
<td>Acute toxicity study via oral route.</td>
<td>Winter rats.</td>
<td>At higher dose level (20 mg/kg) the extract may be hematologically toxic. The acute toxicity study also concluded that the plant is not completely safe as oral remedy.</td>
<td>14 days sub-chronic toxicity studies concluded that doses higher than 20 mg/kg may be injurious to the liver when taken over a long period over time.</td>
<td>Aishokhai et al., 2016.</td>
</tr>
<tr>
<td></td>
<td>Ethanolic extract</td>
<td>Sub-chronic toxicity study via oral route.</td>
<td>Winter rats.</td>
<td>LD50 = 1100 mg/kg</td>
<td>14 days sub-chronic toxicity studies concluded that doses higher than 20 mg/kg may be injurious to the liver when taken over a long period over time.</td>
<td>Aishokhai et al., 2019.</td>
</tr>
<tr>
<td>Ricinus communis</td>
<td>Suspension using distilled water.</td>
<td>Acute and sub-chronic toxicity study via oral route.</td>
<td>Swiss Albino mice.</td>
<td>LD50 = 1587 mg/kg in Swiss Albino mice.</td>
<td>12 weeks sub-chronic toxicity studies in Albino rats concluded that the seed suspension is safe at up to 11.40 mg/kg.</td>
<td>Mahammad et al., 2015.</td>
</tr>
<tr>
<td></td>
<td>Ethanolic extract.</td>
<td>Acute and sub-chronic toxicity study via oral route.</td>
<td>Albino mice.</td>
<td>LD50 = 1100 mg/kg</td>
<td>10 days sub-chronic toxicity studies concluded that use of the extract for a long period may cause toxic effect.</td>
<td>Manal et al., 2018.</td>
</tr>
<tr>
<td></td>
<td>Aqueous n-hexane</td>
<td>Acute and sub-chronic toxicity study via subcutaneous route.</td>
<td>Swiss Albino mice.</td>
<td>LD50 = 547.72 mg/kg</td>
<td>60 days sub-chronic toxicity studies concluded that the extract is relatively safe in rats.</td>
<td>Ubulem et al., 2019.</td>
</tr>
</tbody>
</table>

Datura metel Linn: The plant D. metel belongs to the family of Solanaceae and it is commonly known as Stink weed, angel’s trumpet, Jimson weed and thorn apple (Jadhade et al., 2010). In Nigeria, D. metel is known as Apikan in Yoruba, Myaramuo in Igbo and Zakami in Hausa languages (Table 1). D. metel is found in tropical and sub-tropical areas which include Nigeria, Brazil, India and China (Khaton and Shaik, 2012; Pandey, 2003). The plant is a perennial shrub with simple leaves that are shallowly lobed, glabrous and oval in shape.

Toxicity of Datura metel: Extended usage or overdose of Datura metel L. plant (especially the seeds) may result in toxicity due to the presence of an alkaloid known as tropane (Krenzelok, 2010; Kohnen-Johannsen and Kayser, 2019) (Table 2). Several preclinical and clinical trials have reported that tropane alkaloid present in the plant is the cause of
deleterious and poison effect of D. metel (Krenzelok, 2010). The symptoms of tropane toxicity include changes in heart rate, pupil dilation, constipation, restlessness, ataxia, irritability, respiratory depression and seizures (Krenzelok, 2010) (Table 2). Medicinal Uses of Datura metel: D. metel flowers are used in ethnomedicine for the treatment of inflammations of the skin (Wang et al., 2008). Datura metel seeds are used in traditional medicine for treating skin rashes, bronchitis, ulcers, diabetes, pile and jaundice (Yusuf et al., 2009). The seeds are also used as a sedative (Agra et al., 2007). The whole plant is used for treating asthma and the leaves are used for the treatment of earache (Nargish, 2022; Khaton and Shaik, 2012). The seeds, leaves and roots are used for the treatment of insanity, fever, catarrh, diarrhea, skin diseases and cerebral complications (Khaton and Shaik, 2012) (Table 1). Reports from studies confirm the use of D. metel for the treatment of gouty arthritis (Umamaheswari, 2007). The plant is reported to have anticancer, hypoglycemic, antifungal, antioxidant, immunosuppressive, antibacterial and antiproliferative activities (Akharaiyi, 2011; Khan and Nasreen, 2010; Bajwa et al., 2008; Dabur et al., 2007; Pan et al., 2007; Ma et al., 2006; Dabur et al., 2005; Dabur et al., 2004; Murthy et al., 2004; Sharma, 2002). Physostigma venenosum: The plant Physostigma venenosum Balf. belongs to the family of Fabaceae. The plant is a native to a place known as Calabar in Nigeria. Physostigma venenosus commonly known as esere nut, physostigma, Calabar bean, ordeal bean and chop nut (Proudfoot, 2006) (Table 1). The dried ripe seed of P. venenosum plant is known as calabar bean. The plant is a perennial, herbaceous, high climbing vine, with a woody stem woody at the base. Physostigma venenosum bears purple flowers and the seeds are enclosed in a dark brown pod. The seeds are brown and they have an extremely hard shell. The whole seeds of P. venenosum have numerous therapeutic properties. However, when used in excess, it is highly poisonous (Arens and Kearney, 2019). Toxicity of Physostigma venenosum: Calabar bean (the seeds of Physostigma venenosum) produces alkaloids; the principal alkaloid is phystostigmine, which is extremely toxic (Table 2). P. venenosum seed when taken in excess it causes cardiac arrest, muscle weakness and death (Bathi et al., 2020; Arens and Kearney, 2019). Symptoms of phystostigmine toxicity include seizures, nausea, abdominal pain, vomiting, blurred vision and bradycardia (Arens and Kearney, 2019) (Table 2).

Medicinal uses of Physostigma venenosum: In traditional medicine Physostigma venenosum seed is used for the treatment of convulsion, cholera, hypertension, tetanus and epilepsy (Aihiokhai and Erhabor, 2019). P. venenosum is used in ethnomedicine for the treatment of glaucoma and other eye diseases (Miguel et al., 2012; Scheindlin, 2010; Wickersham and Novak, 2003). Report from studies also showed that P. venenosum seed is used for the treatment of chronic constipation (Wickersham and Novak, 2003). Wickersham and Novak (2003) also reported that P. venenosum seed also acts on the circulatory system to slow down pulse and raise blood pressure. Studies also reported that P. venenosum seed boost the immune system (Aihiokhai et al., 2016). P. venenosum seeds are also used for the treatment of hallucinations, arrhythmias, hypertension, coma, myoclonic seizures and other anticholinergic drug overdoses (Proudfoot, 2006; Scheindlin, 2010) (Table 1 and Table 2). Phystostigmine, a reversible cholinesterase inhibitor alkaloid isolated from P. venenosum seed is reported to be responsible for the treatment of glaucoma after it is rapidly absorbed through the membranes when applied topically to the conjunctiva (Scheindlin, 2010). Phystostigmine is a powerful stimulant used for the contraction of muscles (Miguel et al., 2012; Scheindlin, 2010; Wickersham and Novak, 2003). Phystostigmine is a potent antidote for the treatment of anticholinergic poisoning (Proudfoot, 2006).

Ricinus communis: The plant Ricinus communis Linn is a shrub belonging to the Family Euphorbiaceae and it is popularly known as Castor Plant and Palm of Christ (Roxas-Duncan and Smith, 2012). In Nigeria Ricinus communis commonly known as Ilara in Yoruba, Ogili isi in Igbo, Zurman in Hausa (Table 1). The plant is found in tropical and temperate regions including Germany, India, Brazil, Egypt and Africa (Serpico and White, 2000; Heike et al., 2019). The leaves of Ricinus communis have deep lobes with coarsely toothed segments which are alternate and palmate (Jena and Gupta 2012). The stems have different pigmentation and the bean-like seeds are shiny with variable brownish mottle and the seeds also have a warty appendage (Bradberry et al. 2003; Jena and Gupta, 2012; Trease and Evans, 2002).

Toxicity of Ricinus communis: The seeds of Ricinus communis are poisonous due to the presence of highly toxic substances such as ricin and ricinidine (Liang et al., 2021; Heike et al., 2019) (Table 2). Ricin a type 2 ribosome inactivating protein is highly cytotoxic and it causes cell death (Liang et al., 2021). Symptoms of ricin toxicity include abdominal pain, kidney failure, muscular pains, dyspnea, circulatory collapse, dehydration, liver failure, edema, hemorrhagic necrosis in heart and intestine (Waseem et al., 2018;
Friedman and Rasooly, 2013; Bhaskaran et al., 2014) (Table 2). Ricinine is an alkaloidal toxin that translocates in the plant depending on the age (Worset et al., 2011). Ricinine causes chronic seizures and cell death (Ferraz et al., 2002). There are reports that ricinine can be used for identifying intoxications caused by crude extracts of plants (Darby et al. 2001; Lopez et al., 2017) (Table 2).

**Medicinal uses of Ricinus communis**: The plant *Ricinus communis* is used in ethnomedicine for the treatment of diseases (Table 1). *Ricinus communis* seeds are used in Nepal as an oral contraceptive (Heike et al., 2019). The leaves have hepatoprotective, antiinociceptive, anti-inflammatory, anticonvulsant and analgesic activities (Ladda 2014; Princea et al., 2011; Taur et al. 2011; Anil et al., 2010; Tripathi et al., 2010; Ilavarasan et al., 2006). The root have Antidiabetic, antiasthmatic and antimicrobial activities (Dnyaneshwar et al., 2011; Abhishek et al., 2011; Islam et al., 2010; Shoeken et al., 2008). The seeds have anti-fertility activity (Sandhyakumary, 2003). Castor oil from *R. communis* seed possess, antulcer and wound healing activities (Nath et al., 2013; Rachhadiya et al., 2011; Prasadet al., 2011).

*Ricinus Communis* oil is also used for cleaning the eyes for better visualization (Sandford et al., 2021; Ramanjaneyulu et al., 2017). *R. communis* have been found to have antimicrobial, antifungal and anti-cancer properties (Saha et al., 2016; Abd-Ulgadir et al., 2015; Abew et al., 2014; Vandita et al., 2013; Ravishankar et al., 2012). There are reports from previous studies that *R. communis* have anti-inflammatory, antioxidant, analgesic, anticonvulsant, anti-fertility, anti-helminthic, bone regeneration, laxative and uterine contracting activities (Ziaei et al., 2016; Nathet et al., 2015; Nemudzivhadi and Masoko 2014; Rana et al., 2013; Tunaru et al., 2012; Lindauer et al., 2010; Tripathi et al., 2010; Singh et al., 2009; Elimam et al., 2009; Almeida et al., 2001; Isichei et al., 2000).

**Conclusion**: The medicinal use of *Abrus precatorius*, *Datura metel*, *Physostigma venenosum* and *Ricinus communis* seeds are in ethnomedicine and the toxic compounds (toxins) responsible for the toxicity of the seed of these plants were discussed in this review. Toxicity symptoms caused by the toxin(s) present in the seed of these plants and the use of the toxins in medicine was also discussed in these review. Previous studies carried out on these plants confirmed some of the medicinal properties of these plants, the toxins responsible for the toxic effect of the seeds and the medicinal effects of the toxins isolated from *Abrus precatorius*, *Datura metel*, *Physostigma venenosum* and *Ricinus communis* seeds. Further studies are recommended to be carried out on other medicinal plants reported to have toxic effects so as to isolate and evaluate the possible therapeutic activity of the toxins responsible for the toxic effects of the plants.

**Declaration of Conflict of Interest**: The authors declare no conflict of interest.

**Data Availability Statement**: Data are available upon request from the corresponding author.

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