From time immemorial people have used plants for healing. Folklore medicinal system make use of natural products and have been used with varying success to alleviate and prevent diseases throughout history, and serve mankind with new remedies (Raskin et al., 2002). Statistical analysis revealed that out of about 250,000 flowering plants in the world (Thorne 2002) more than 50, 000 are used for medicinal practice. The World Health Organization (WHO) estimates that about 75 % of the world population, especially of developing countries depend on traditional remedies (mainly herbs) for their primary healthcare, this is due to poverty or lack of availability to modern medicine. On contrary in developed world people use herbal medicines with the belief that it will encourage healthier living since most of this therapy involves the use of plants extracts or their bioactive components (Gilani and Atta ur, 2005). Medicinal plants sector has acquired an important position in the sociocultural, spiritual and medicinal area of rural and tribal lives of India. Total market value of herbal extracts valued in 2016 was USD 27.1 billion. It is estimated that this ratio will reach USD 44.6 billion in 2024 (Aliu et al., 2019). Patients suffering from variety of chronic illnesses, such as depression and epilepsy, take herbal therapies for many reasons. Patients in developed countries may view herbal therapies as natural and time-tested and therefore safe in contrary to synthetic drugs. Also, in developing countries, there is accessibility to herbal therapies but not to pharmaceuticals, because of cultural and economic factors (Schachter, 2009). Although these herbal therapies are increasingly been used, they often remain untested and their use is often not monitored. Therefore, scientific knowledge of their effectiveness and potential side effects is limited. This makes identification of the safest and most effective therapies and promotion of their rational use more difficult. The study of plant species used traditionally should, therefore, still be seen as a fruitful research strategy to provide new and important leads against various pharmacological targets and to help humanity, especially the developing world

who depend heavily on traditional medicines, more effectively fight their diseases. Considering the great reliance on traditional medicinal plants for treatment of diseases and the potential for drug discovery, it becomes pertinent to search for potent, effective and relatively safe plant medicines as well as to scientifically validate success claims about plants already in use by traditional medicine practitioners (Houghton 1995).

Epilepsy is a major neurological disorder characterized by recurrent, spontaneous brain seizures or convulsions and its prevalence in developing countries is generally higher than in developed countries (Stafford et al., 2008). Epilepsy is the second most commonly encountered neurological disorder after stroke and it is estimated that approximately 0.8% of the population is affected by some form of epilepsy (Pitkanen et al., 2009). It is estimated that there are more than 10 million persons ailing with this disorder in India. The prevalence of this disorder compared to urban population (0.6%) is higher in the rural (1.9%) (Meinardi et al. 2001). Reports suggest that people from socio-economically deprived backgrounds in developed countries are more likely to develop epilepsy (Heaney et al., 2002). This neurological disorder is regarded as a shameful disorder and has severe social implications in Indian communities as it carries a stigma. This stigma becomes more pronounced when sufferers are shunned and discriminated against with respect to education, employment and marriage (Stafford et al., 2008). Drug therapy of epilepsy with currently available Antiepileptic Drugs (AEDs) is characterized with side effects, unpredictability of efficacy, dose-related and chronic toxicity that involve virtually every organ system. Moreover, all the currently available AEDs cause some degree of cognitive, behavioral, or psychiatric adverse reactions (Duncan 2002). The practice of polypharmacy in the therapy of epilepsy that has doubtful background increases the risk of side effects and drug interactions. It can be said that all problems with the current AED therapy of epilepsy are more prevalent in underdeveloped countries due to

lack of facilities for proper diagnosis, treatment and monitoring of serum levels of AEDs. Another major issue associated with currently available AEDs is recent clinical and experimental data that strongly suggest that AED therapy does not alter the course or natural history of epilepsy and though AEDs suppress the seizures, they may not treat the underlying disorder (Chadwick 1995). Only a very few AEDs have been shown to be antiepileptogenic potential which includes valproate and phenobarbitone (Duncan, 2002) and levetiracetam (Loscher et al., 1998) but these are not well substantiated. There is a desired need for further research especially in the field of pharmacotherapy of epilepsy to find drugs which are not only anticonvulsant but also antiepileptogenics that either prevent epilepsy or alter its natural course. Natural products and plants for that matter, used in traditional medicine can be an invaluable source for search for novel antiepileptic compounds (Stafford et al., 2008).

Pyrus pashia (Hamilton ex D. Don; Family: Rosaceae) is a deciduous plant with small and ovate shaped toothed leaves, attractive white flowers, and small pear-like fruits. It is widely distributed across the Himalayas from Pakistan to Vietnam and from the southern provinces of China to the northern regions of India. The fruits of this plant are well known for their nutritional values and are reported to be used in the preparation of herbal wines. Traditionally, the fruits of this plant are used in cuts, wounds, fungal infection, mouth infection, and eye complaints in the Mandi district of Himachal Pradesh. In folk medicine of Garhwal region, fruits of this plant are traditionally being used in the treatment of digestive disorders. Ripened fruits are considered as edible by many tribes and are also used against nervous disorders such as epilepsy (Hemalatha et al., 2016). An earlier study revealed the presence of phenolic and flavonoid compounds in the ethanolic extract of the fruit of *P. pashia* (EPP) (Sharma et al., 2017). It is well established that polyphenols and flavonoids exhibit significant antioxidant and anti-inflammatory activity against cellular damage. Moreover

these polyphenols are implicated in treatment of epilepsy (Lason and Leskiewicz 2013). However, despite the wide usage of this plant ethno medicinally there is no scientific data in literature on its pharmacological activity against epilepsy.

Hence this work seeks to investigate pharmacological basis of *P.pashia* fruits and its major bioactive polyphenol chrysin for treatment of epilepsy and delineate possible underlying molecular events triggered as a response to cell death, generated by chronic seizures. Study also intends to establish the pharmacognostical and phytochemical standardization for the fruits of *P.pashia*. Pharmacognostical standardization includes macroscopical, microscopical and physicochemical evaluations. Whereas phytochemical investigation involved the polyphenolic fingerprinting of EPP and standardization of EPP with its major polyphenol chrysin.