

Biological Explanation of Jenova:

The Crisis from the Sky

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Abstract

In the game Final Fantasy VII, one of the main antagonists is the alien creature Jenova. This creature landed approximately 2000 years before the start of the game in the northern part of Gaia, the planet on which the game takes place. It approached the dominant race at the time, the Cetra, and through its abilities, decimated the population. In a last-ditch effort to protect the planet from the threat, the remaining Cetra banded together and managed to seal Jenova in a geological stratum where it remained dormant for millennia.

It was only after the Cetra had almost entirely died off and modern humans had taken their place that it was found by the Shinra Corporations' Professor Gast. Professor Gast confused the alien creature to be a Cetra. This fatal error leads the creature to being used in several experiments which allowed it to ply its abilities in attempt to drain Gaia of energy and use it as a vessel to travel to its next host.

Analyzing Jenova's supposed lifecycle and abilities was done with a purpose in mind. That is to determine what sort of organism Jenova most closely resembles. With research into both the game's lore as well as biological information, the conclusion has been made that Jenova is most like fungal parasite.

Keywords

Final Fantasy VII, Jenova, Game Story Theory, Biological Studies, Fungi

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All data used within this manuscript is either from original game sources or from published articles. They are freely available on the web.

Code Availability

Not applicable

Ethics approval

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Consent to participate

Not applicable

Consent for Publication

I am the only author of this paper and hereby give my consent for publication of this manuscript.

1 - Setting the Groundwork

Gaia is the planet that the game Final Fantasy VII takes place on and the Cetra were the first race of sentient peoples that existed. Additionally, humans could be called a child race of the Cetra as the distinction is mostly based in their lack of natural magical and planet reading capabilities. Other things must be recognized about the planets in the universe as well. The main fact that must be established is that each planet has a flow of spiritual energy known as a Lifestream. From this Lifestream, all creatures great and small receive of it when they are born and return to it when they die. The planet reading capabilities the Cetra possessed was, in fact, the ability to hear the voices of those who had returned to the Lifestream. This energy is what Jenova consumes while on a planet. It should also be stated that without this energy, the planet cannot function as an ecosystem and cannot sustain life. Thus, to rob a planet of energy is to kill it and leave it as a lifeless husk.

Additionally, it should be noted that this energy may gather in areas where the planet has been wounded. An example of this is a crater from a meteorite crashing into the planet like Jenova causes upon its landing. The environment of the planet can be affected by this draw of energy. The area surrounding the northern crater in the game, known as the Knowlespole by the Cetra, was not always a frozen tundra. It only became so after the planet drew energy from the land into the crater itself to heal the wound.

2 - The Suggested Life Cycle of Jenova

From what is suggested by the game and other supplementary material, it seems that Jenova acts as a parasitic creature and preys on full planets. The meteorite that landed in the northern part of Gaia was likely, in fact, the remains of its last host. Its assumed uninterrupted lifecycle is as followed:

1. Landing on a planet and causing it injury, Jenova begins its infection.
2. Using its abilities, it first sees to any threats which could stand a hope to resist the infection as it attempted to do with the Cetra.
3. After any threats are neutralized, it begins to drain the planet of energy. This is where Jenova failed on Gaia and was forced into hibernation.
4. After the energy is taken, it turns the husk of the planet into a meteorite.
5. Using the husk, it directs itself through space, searching for another host.
6. Finding a host, it lands on it and the cycle begins again.

This cycle is based off several pieces of information given by both the original game and supplementary material. Examples of this material include Advent Children where Sephiroth claims “What I want, Cloud, is to sail the cosmos with this planet as my vessel. Just as Mother did long ago.”, and Ifalna’s description of Jenova when talking to Professor Gast in the original game.[5,9]; to clarify, Ifalna is the last full blooded Cetra and Aerith’s mother. It should also be noted, as the cycle states, Jenova can hibernate for extended periods. It is unknown how much damage this does to it, but it can be assumed from the display of powers in the game that it does little to no harm.

3 - The Abilities of Jenova as Compared to Fungi

3.1 - Ability to Hibernate for Extended Periods

As mentioned in the last section, Jenova can hibernate for great lengths of time. One need look no further than the mycelium of a fungus which contain the various hypha for this trait. Mycelium is well known for the ability to be put into dormancy for long periods, though it depends on the storage condition and strain as to how long this storage can be kept. Depending on the strain, mycelium may even last years in the right temperature and storage method [7]. This is in part because some strains will stop growth in the cold and, much like the spores they develop from, remain dormant until better conditions arise.

3.2 - Dimorphic Behavior of Cells

One of the main traits of Jenova is the fact that its cells can behave as a unicellular pathogen or multicellular construct. We see these abilities in unicellular form when the Jenova Project takes place and in multicellular form when it poses as Sephiroth and Tifa in the game. It can act as both a single-cell entity and a multi-cell entity. While it cannot be claimed every kingdom of life has been checked thoroughly for this trait, the only type of kingdom that seems well known for this ability is the fungi kingdom. Thermally reactive fungi are a common example of this trait. This type of fungi, known for being parasitic against mammals who will inhale their unicellular form and be infected as a host starting in the lungs, is known for having numerous species which can perform this act [1].

This trait is important because many other traits Jenova possesses would not be possible without this dimorphic behavior. In the following sections such as Influencing the Host and Adaption of Characteristics of Past Hosts, this ability to act as a unicellular or multicellular entity allows Jenova both to be a pathogen which infects others as well as a larger entity that can influence those around it by taking various forms.

The fact that the dimorphic behavior is determined by gene expression likely means Jenova gathers and stores genetic material within a biological catalog contained within the central body. The shapeshifting abilities can then be explained as changing its cellular gene expression to match that of the gathered material, thus taking on their likeness. A rapid division of cells to allow growth to match the targets size is likely also involved.

3.3 - Parasitic Behavior

Jenova's modus operandum is parasitic by nature. The definition of a parasite is an organism that "lives on or in a host organism and gets its food at the expense of its host" [2]. With the host being the planet, which in this universe is a living thing with energy to be consumed, Jenova is a parasite which the planet itself hosts. Fungi are well-known as parasitic in nature as well. While parasitic behavior is not a universal trait of fungi, many species sustain themselves by attacking and feeding from hosts [8]

3.4 - Influence Over Host

Jenova retains the capability to, in its pathogenic form, effect the behavior, actions, and form of its host. Cloud is most definitely an example of this trait, having had cells from Jenova injected into him after the Nibelheim incident five years before the game takes place. Events such as Cloud handing over the Black Materia to Jenova (disguised as Sephiroth) after the Temple of the Ancients, attacking Aerith after he did, and nearly striking Aerith down on the pedestal in the City of the Ancients are all examples of Jenova's latent control over Cloud's mind and actions.

However, it is fair to mention that those with strong wills can resist this control. Zack apparently does so when escaping with Cloud from Nibelheim. Therefore, who is dictating events between Jenova and Sephiroth at the end is difficult to determine. With Sephiroth's apparent desire being the same as Jenova's (the gathering of energy to absorb), it's very difficult to say if he was doing this for his own desires or was still being influenced to do Jenova's bidding. While many official sources do state Sephiroth is controlling Jenova's cells, it is never stated that Sephiroth's goals are what otherwise would have developed had Sephiroth not discovered Jenova and his birth circumstances. Therefore, it is possible that his goals are the left-over influence of Jenova even though he is the one perpetrating the actions himself.

We see multiple cases of its form manipulating capabilities. From turning the black caped figures to look like Sephiroth and Tifa to the fact that Ifalna claims that it took the form of the Cetra's dead mothers and brothers all

show the use of shapeshifting capabilities. This ability was mentioned above in the Dimorphic Behavior of Cells section.

Different species of fungi exhibit these various traits. For example, the shapeshifting capabilities can be explained as the hijacking of various parts of a host's cellular structure to manipulate it. The fungus *Beauveria bassiana* is being looked at as insect suppression for crops [3]. This fungus functions by releasing RNA that influences certain structures of the host and prevents immunogens in the insects from being deployed, allowing easier infection. Thus, if fungi can produce RNA to cause such a reaction, in the realm of science fiction this trait can be exaggerated to include severe changes to the bodily structure of the host.

For the influence of behavior and action, we need look no further than the Cordyceps fungus, which has been used as inspiration for other games such as the zombie focused game "The Last of Us". The Cordyceps fungus is well known for its capabilities to infect insects and control their actions. In ants, for example, the fungus will drive the ant to climb as high as possible and clamp down on its platform with its mandibles [10]. The fungus then bursts from the ant's head and releases spores. The action of the ant climbing up is to give the fungus the best chance for the spores to find other hosts.

3.5 - Adaption of Characteristics of Past Hosts

We know from Ifalna's testimony that Jenova can take the form of other creatures. She claims that Jenova appeared in the form of their dead brothers and mothers, first befriending them before finally infecting them; she also claimed they transformed into monsters from this infection [9]. This suggests one of two things: Jenova infected these dead relatives beforehand or was able to take their form without actual contact. With the fact that it took Tifa's form as well without infection (though she did have significant contact to the infected Sephiroth when he wounded her), it does seem to lean toward the latter. However, it is possible that it had enough genetic data on similar creatures that it was able to form profiles for these people. Overall, this ability is the one that is least able to be tied to an existing fungus, but the previous mentioned biological catalog idea is still a viable one. With studies showing that fungi can somehow remember unpleasant event and even time when those events will occur, the idea of a fungus somehow saving a genetic profile in a single cell library of biological creatures seems [6]. Additionally, with the discovery of the "wood wide web" which will be touched on in more detail in the next section, the cells could communicate with each other.

3.6 - Disembodied Coordination

A theory presented in the game about Jenova that was later confirmed was the Jenova Reunion theory. First postulated by Professor Hojo, the theory goes that if Jenova's body is split into many parts, those individual parts will seek to reunite. This theory is later vocally confirmed by Hojo due to Cloud, who, under the influence of Jenova, travels to the Northern crater where the reunion is taking place and hands over the Black Materia. Assuming that this theory in the game is sound, we must assume the various disconnected cells have a means to communicate with each other.

The "wood wide web" is the nickname scientists have given to the fungal network that has been found to exist. This network connects to the roots of plants and allows these plants to communicate with each other through the fungal strands of mycelium that link up in the ground. It has been found that its possible that older and more established plants may pass nutrients to younger ones via this network. Another use is the possibility of poisoning unwelcome plants with certain chemicals which could be passed from root to root via the mycelium [4].

With the existence of this sort of network established, it means different pieces of fungus could communicate in similar manner. But this leaves one part out. How would it do so when many of its hosts are not connected to the ground via roots? We need only consider the type of parasitic infection Jenova presents and what exactly it infects. Jenova infects the planet itself and that includes the flow of energy each planet has. Therefore, it could easily spread a mycelium or other type of cellular network through the Lifestream. Then communication would be possible between various parts of Jenova because every creature it infects is part of the planet's stream. It was established earlier that communication between creature and Lifestream is possible via the Cetra's planet reading ability. Therefore, it's not a difficult leap to say that Jenova can create this link between various parts of itself.

An example of this idea in the expanded universe is that of the Geostigma virus presented in Advent Children. This virus was spread to many people and was the result of encountering the swelling Lifestream at the end of the original game. It is established that parts of this Lifestream was infected with Jenova's memetic legacy. This lends to the idea that Jenova does infect the Lifestream and thus strengthens the idea that this is how communication happens between various parts.

4 - Conclusion

Jenova as a threat to the planet is an interesting concept and very much worth looking at through a scientific lens. By analyzing fictitious alien creatures, we gain a better grasp on the biology of creatures that do

exist. Its lifecycle shows a distinct pattern of parasitic behavior, and its traits seem to lend themselves well to the theory that Jenova is biologically closest to a fungus. Between the original game and the various pieces of expanded media that have added to the universe, Jenova's existence has been highly detailed and thus provides ample information to piece together and reach this conclusion.

5 - About the Author

I started this paper to formalize my thoughts about the idea Jenova being a fungus. It was a fun project to practice my writing skills at formal papers and allowed me to research into a topic I didn't know much about. I am a coder and computer scientist by trade, so biology was never a subject I had much experience in. Therefore, quite a bit of research went into ensuring all my postulations were sound.

I first played Final Fantasy VII when I was seven years old in the year it came out. I've been enamored by the game and its universe ever since. As the paper suggests, I believe that on some level Sephiroth was not fully in control of his own actions. Thematically, I feel it makes the story stronger and makes him a better foil to Cloud if this is the case. However, seeing the official sources claim he was the one in control forced me to rewrite some of this paper to reframe the idea more. Instead of Jenova being directly in control, it made more sense to say he was in control but still perpetrating Jenova's will. In the same way one might finish the task their father started: I still feel that Sephiroth is heavily influenced by Jenova's original goal. In this case, the goal has become his own, but still wouldn't exist without Jenova's influence.

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